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Two Large Sales of Pig Iron

Mill Operations on a Larger Scale

A Broader Market for Finished Materials in Nearly All Lines

The market in finished lines is broadening. The mills are getting the effect of the January improvement in new orders and in the past week running schedules have been fuller all over the country. At the same time the rate at which new business has been entered upon order books has kept up to that of the second half of January, with rails excepted, and in some lines has exceeded it.

Pig iron has been active in the Chicago district. At the attractive prices named by Southern sellers and met by Northern makers, the leading agricultural machinery interest has bought freely, the total being estimated at 100,000 tons, deliveries extending through and beyond the third quarter. A pipe company has also taken 50,000 tons of Southern and Valley irons, deliveries covering the second and third quarters.

While pig iron buying has been by no means general, the amount of business quietly put through has signified both the lowest prices in months and the belief of important buyers that they marked the turning point. Quoted prices vary more than for many weeks, and in some districts furnaces are definitely holding out for 25c. to 50c. advance.

Following the recent sale of 6000 tons of basic iron at $13.25, at Valley furnace, one of 3000 tons has been made at $13.50. Furnaces are now holding for $13.75 as a minimum. Bessemer iron is inactive, but a sale of 1250 tons is reported at $15.

In semifinished steel prices appear to be firmly maintained. A sale of 2000 tons of open hearth sheet bars has been made at $24, Pittsburgh, and one of 2200 tons of high carbon forging billets at $29, Pittsburgh.

All the steel companies report a larger scale of operations, ranging in some cases from 75 to 90 per cent. of mill capacity. The Steel Corporation now has 60½ per cent. of its blast furnace capacity active, as against 46½ per cent. at the low point at the opening of the year. Its statement of unfilled orders January 31, showing 436,000 tons more than on December 31, the first gain in 13 months, quite exceeded the highest prediction. February promises no duplicates for the New York Central and Pennsylvania rail orders and its export total may not be as great.

New rail business has been light this month. A 15,000-ton contract for girder rails for the Chicago City Railways has been divided between the Steel Corporation and the Pennsylvania Steel Company, the former getting 10,000 tons. Railroad enterprises in various foreign countries are reported promising and the outlook is for an export trade in American rails equal to the excellent total of 1910.

The rail mill of the Illinois Steel Company at South

Chicago, which was shut down when the Gary mill resumed last month, will be started next Monday. Both mills have orders that will occupy them until July 1.

Among the latest structural contracts are 2800 tons for the new plant of the Corn Products Company at Argo, Ill.; 4400 tons for a bridge over the Arkansas River at Ft. Smith, and 3500 tons for the Cruikshank warehouse in New York. The new Delaware & Hudson shops will require 4000 tons. On March 15 the Panama Canal Commission will open bids for 12,000 tons of structural steel for emergency dams. The New York Telephone Company is planning a new building that will take 10,000 to 15,000 tons.

Plate mills are busier, and some of them reached a 75 per cent. basis last week. A Pittsburgh builder of gas holders has bought 5000 tons of plates for Minneapolis and St. Louis contracts.

Pipe mills are running at 50 to 60 per cent of capacity. Some good pipe line contracts are pending. The Tri-State Natural Gas Company is inquiring for 70 miles of 3 to 10 in. pipe, and the Eastern Oil Company has bought 25 miles of 12-in. pipe.

Some wire interests, with their large advance bookings, have favored a higher price, but there is a strong sentiment against any change unless the spring demand expands unexpectedly.

Scrap markets are advancing and speculative buying is a growing factor. Heavy melting steel is particularly strong, advancing 75c. a ton in the Pittsburgh market this week. Railroads are evidently holding their accumulations for higher prices.

Spot tin sold in the New York market February 15 at 45.75c., against an import price of 43.15c., indicating an active cornering operation right at home.

Steel Corporation Production, 1901-1910

On March 31, 1911, the United States Steel Corporation will round out its tenth year, and the anniversary will naturally bring out some interesting comparisons. Reference was made in these columns recently to the United States Steel Corporation's share in the pig iron and the steel ingot production of the country in 1910. Its pig iron output last year was approximately 11,800,000 tons and its steel ingot output about 14,150,000 tons, as officially stated. What is of particular interest in these figures is that the Steel Corporation's percentage of the country's pig iron production last year was exactly, to 1-10 of 1 per cent., what it was 10 years ago in the corporation's first year —namely, 43.2 per cent. This does not answer the question, What percentage of the country's pig iron producing capacity belongs to the Steel Corporation? That would be somewhat difficult to arrive at. Theoretical capacity is one thing, but practically available capacity is quite another. A low price for pig iron would rule a certain percentage of furnaces out of consideration, for many could not be operated except at a loss on a level of prices which to others would yield a fair profit.

Probably, owing to the conditions prevailing in the second half of last year, which led it to reduce steadily the number of its active furnaces—the curtailment being more drastic than in the case of other companies, over which to some extent it apparently held the umbrella—the Steel Corporation's percentage of the 1911 output was less than its capacity percentage. Further, it has two blast furnaces at Gary, which have never been in commission. At all events it is a significant fact that after 10 years of vigorous blast furnace building the Steel Corporation should produce in the year of high record pig iron output precisely the percentage of its first year of operations.

The pig iron comparison is not quite what it should be, since the Steel Corporation's pig iron, all of which enters into steel, is compared with a total in which foundry iron is an important factor. Taking steel ingots as the basis, we find that the Steel Corporation was less of a factor last year than in 1901. The figures for both pig iron and steel ingots are as follows:

The Steel Corporation's Share of Pig Iron and Steel Ingot Production in 1901 and 1910.

	1901.	1910.	Per ct. 1901.	Per ct. 1910.
PIG IRON.—GROSS TONS.				
Steel Corporation	6,859,000	11,800,000	43.2	43.2
Other producers	9,019,000	15,498,000	56.8	56.8
STEEL INGOTS.—GROSS TONS.				
Steel Corporation	8,919,000	14,150,000	66.2	56
Other producers	4,554,000	11,150,000*	33.8	44

* Estimated.

The estimate of steel ingot production in 1910 by producers other than the Steel Corporation is based on the known fact that the Steel Corporation increased its ingot production of 1909 by 800,000 tons. It is fair to estimate that the other steel interests made at least a corresponding increase, which would give them, say, 600,000 tons more than in 1909, when the country's total was 23,955,021 tons. It appears from the figures that whereas the Steel Corporation produced 66.2 per cent. of all the steel of the country in 1901, its percentages in 1909 and 1910 were but 55.7 and 56, respectively. Such a performance in the two years of the country's high record production indicates plainly that it has not maintained its original position as a steel producer. This has taken place in spite of the prodigious additions to the corporation's steel making plant in the past 10 years, both by new construction and the absorption of three large competitors—the Union Steel Company, the Clairton Steel Company and the Tennessee Coal, Iron & Railroad Company.

A Better Outlook for the British Iron Trade

When the statement of British foreign commerce in 1910 appeared a few weeks ago surprise was expressed that so much complaint should have come from iron and steel manufacturers there last year. Total exports and imports of 1108 million pounds sterling for 1910, against 1071 million pounds in the boom year 1907 seemed to spell prosperity for all industries. Yet in the iron trade the year was a good deal short of a record one, and at no time did British iron market reports indicate that either in price or volume was the business satisfactory. There has been at times a disposition among some British steel manufacturers to lay their trouble on the free access foreign steel products, particularly semifinished steel, have to their market. But they have never been self-contained in ore, and some of their sheet and tin plate and other mills have at times found it to their advantage to accept Germany's attractive offers on semifinished steel. Moreover, it has been the British destiny to draw raw materials from without and ship finished products. But 678 million pounds of imports last year, against 645 millions in 1907 and 430 millions of exports against 426 millions in 1907 accentuates the preponderance of

imports in a way that is well calculated to foster anti-Cobden sentiment.

But leaving out of the account influences that may be slowly at work in the British iron trade, in contrast with the evident expansion in the United States and Germany, the outlook for 1911 is more promising. The London *Iron and Coal Trades Review* cautiously yet hopefully refers to it in the following, after noting that with cheap money and promised freedom from labor troubles the prospect for all industries seems improved:

> The Board of Trade returns, whatever their defects, must be regarded as affording some more or less reliable indications of the measure of prosperity the country is enjoying, especially as in this instance they are supported by the records of railroad earnings, bankers' clearings and labor statistics, all of which are of a favorable character, and, even, if the beneficial results of our improved foreign commerce are not yet fully felt, indicate the direction in which we are traveling, and encourage the hope that during 1911 we shall continue to advance along the same road. In the iron and steel trades, very favorable factors in the situation are the prospects of peace in the shipbuilding yards, the large amount of new tonnage on order and the improving freight market, which is likely to lead to further contracts before prices of material rise much higher than they are at present. The iron and steel trades, of course, are not entirely dependent upon the shipbuilding industry, but it is their best customer in this country, and when it is languishing, they cannot be active, while when it is flourishing they must feel the benefit. Then again a host of other important industries are dependent upon shipbuilding and will profit accordingly. . . . So far as can be judged by present indications, there is no apparent reason why the hopes entertained of a steady improvement in trade during 1911 should not be realized and some apparent reason why they should.

The above forecast, based to so large an extent on the British export trade, reflects the continued healthy condition of the world's iron and steel trade that has been indicated by the increasing exports from the United States. With all that is likely to come from the present improvement at home, the export demand in 1911 must be counted on to furnish respectable running schedules to certain mills, particularly in the Pittsburgh district.

The Engineer in Steel Foundry Practice

A great American plant which manufactures and consumes large numbers of open hearth steel castings, many of them small, has demonstrated that a close relationship between the engineering staff and the foundry results in a high proportion of satisfactory castings. At the present time more than 90 per cent. of the pieces delivered to the shop pass the test of machining without revealing blowholes. Formerly in the same works good castings were rather the exception. It was demonstrated that the engineering staff, by furnishing the foundry with the details of each mold, accomplished wonderful improvements in practice. The keynote to success was found to lie in very large risers and plenty of ventilation. Other details were studied out scientifically.

The skill of the experienced foundryman, great though it may be, often savors of guesswork. System in the maintenance of records is often lacking. Empirical judgment cannot always bring results equal to those obtained by the exact calculations and tests and analyses of the engineer. In the works in question, each pattern is studied with the foundry problem in mind. With some pieces the preliminary work is costly, but good castings are obtained. The saving in the waste of machining defective pieces—a waste that includes labor and general costs—more than makes up for the expense of getting down to correct practice in producing any given casting.

Not all of the steel foundries do good work. Some users are fortunate in getting what they are after. Others have abandoned the use of cast steel wherever drop forgings could be substituted. Of course there is a limit to the expense to which a foundry can go, unless the customer is willing to pay for it. The user of castings in which blowholes would be a vital defect should be willing to pay a high price, if by so doing he can get a high percentage of perfect castings. Probably the engineering side of steel foundry practice is seldom developed to the perfection related in the case cited. The more closely such examples are followed, probably the greater the success of the industry.

Railroad Securities as Investments

Events of recent years have cleared up a great deal of uncertainty regarding railroad securities as investments. The efforts of State legislatures and of Congress to enact laws that would meet the popular demand for regulation of the railroads have established the fact that these corporations which have built the highways of the country have rights which cannot be assailed. The railroad is entitled to charge rates which will afford a reasonable return on its capital, and there is no legislative power, either in the States or the National Government, which can encroach seriously upon this right.

This amounts to an indirect guarantee by the Government of railroad bonds as investments, and stocks also share in this safeguard so long as they bear a reasonable relation to the value of the actual property or investment in the railroad. For all practical purposes, railroad bonds have become as safe an investment as the obligations of the Government. Bonds issued by the National Government have no security except the honor of Congress. The Government might repudiate both interest and principal, and there is no tribunal through which the investor could enforce payment. The note issues of the Continental Congress were ultimately redeemed at one cent on the dollar. Other republics on this continent have repeatedly defaulted or repudiated their obligations. Bonds issued by our own Southern States during the reconstruction period, after the Civil War, were repudiated to the extent of several hundreds of millions of dollars, and investors have never discovered any means of collecting interest or principal, because there is no court that has jurisdiction to enforce payment. A county, city or other municipal body may issue bonds, and if it becomes bankrupt, either through extravagance or depreciation of its property, the rights of the investor are limited.

When a railroad defaults in the payment of interest on its bonds or other direct obligations, the courts appoint receivers, whose primary duty is to safeguard the property in the interest of the bondholders. Local railroads, which "begin nowhere and end nowhere" have sometimes been sold out in bankruptcy at a loss to the bondholders, but such cases have been exceedingly rare in the case of large companies or systems. In the receiverships of 15 years ago, even the holders of junior issues received full value for their securities. During the period of rapid construction, from 1870 to 1890, new railroads, especially in the West, had been financed with long time bond issues bearing 6 and 7 per cent. interest, and in many cases securities had been issued recklessly for amounts far in excess of the actual cost of construction and equipment. The large systems which became

bankrupt merely broke down under the burden of paying high rates of interest on excessive capitalization.

The older railroad systems, which have followed from the beginning the practice of issuing no stock except for cash paid in by investors, have never failed to pay attractive dividends. As a rule they have paid 5 to 7 per cent. dividends from the beginning, and have continued regular payments for 50 and 60 years. During the past 10 years practically all the large railroad systems of the United States have adopted this conservative policy of issuing no stock except for cash subscriptions, usually at par. This not only safeguards their underlying bond issues, but has strengthened them financially to such an extent that they were able to earn and pay full dividends in the depression following the panic of 1907.

Many of the Western railroads which became insolvent in the '90s were "one crop" roads. They were built to open new wheat country, and when the world's markets became congested with wheat and the price declined, they were unable to earn operating expenses and their heavy burden of interest. With the growth of a new country crops become diversified, industries are established, and the traffic of the railroad is safeguarded. In all parts of the country the density of traffic increases with the growth of population and industries and thus the earnings of the railroad increase steadily, year after year, and afford a larger and larger margin for the payment of obligations.

In the past the railroads have only been able to sell bonds or securities at long intervals, on any large scale, and their purchases of iron and steel and equipment have been more or less contingent on their ability to sell securities. This has created periods of great activity and corresponding depression in the steel industry. The ebb and flow in manufacturing industries has thus been due to the fact that investors have only been willing to purchase railroad securities, to any large extent, at long intervals when there is no other active demand for money. When the fact becomes recognized that railroad bonds are as safe as those issued by governments, and in many ways more desirable, the railroads should be able to find a more regular market for their securities and thus become more continuous patrons of the industries which supply them with materials and equipment.

The Crucible Steel Company Secures Controlling Interest in Halcomb Steel Company

At Pittsburgh, on February 11, a deal was consummated whereby the Crucible Steel Company of America has secured a controlling interest in the Halcomb Steel Company, Syracuse, N. Y. Press reports have had it for some days that the Halcomb Company had been bought outright by the Crucible Company, but this is not correct. No transfer of interests of the Halcomb Company was made until the date named, and that company has not been absorbed by the Crucible Company, but there has simply been an interchange of stock, and the latter company is now the largest stockholder in the Halcomb Company and controls its operations.

Forest S. Wilkinson, president and general manager of the Halcomb Company, states that the plant will continue to be operated as an independent works, but at the same time the Crucible Company will direct its operations. The plant of the Halcomb Company was built and put in operation in 1906. Its capacity is slightly above 20,000 tons of high-grade steel per year, part of which is finished into the finer grades of wire, such as needle wire, needles, &c. The company has also furnished a large amount of high-grade steel to automobile builders.

The Triple Supply Convention

Marked evidence of the "get together" spirit for the good of all is the announcement made last week that the American Supply & Machinery Manufacturers' Association, the National Supply & Machinery Dealers' Association and the Southern Supply & Machinery Dealers' Association are to meet in triple convention at Louisville, Ky., April 3, 4, 5. This indicates a very happy condition of cordiality between the manufacturer, the jobber and the dealer. It shows harmony and general good will toward each other, an example that might well be followed by a number of organizations existing for the mutual benefit of those so associated.

The American Supply & Machinery Manufacturers' Association is composed of a large number of prominent manufacturers of machinery, power plant accessories and general mill supplies, and has been in existence about seven years. In this time it has accomplished much more in a spirit of uplift, a higher ethical plane and the development of a more comprehensive understanding of good business principles than is common in such organizations. A very unique feature is the conduct of a general promotion or advertising department for the benefit of its members. This involves a general advertising service of a distinct nature, for which no extra charge is made. This service, if obtained through regular channels, would cost considerably more per year than the nominal dues incidental to membership in the organization. The triple conventions, above described, enable manufacturers or dealers to attend three conventions at the price of one.

The Bureau of General Promotion for the American Supply & Machinery Manufacturers' Association is located at 55 Woodbridge street west, Detroit, Mich., and is under the direct supervision of William M. Chamberlin, for many years engaged in general advertising work in the power plant and mill supply field. The general headquarters of the association are located at 309 Broadway, New York City, under the direction of F. D. Mitchell, secretary and treasurer. Inquiries for further information relative to the association will receive prompt attention if directed to either office.

As a result of the special campaign for new members recently started by the American Supply and Machinery Manufacturers' Association, the following firms have been added to the membership roll, all having agreed to the declaration of principles of the organization: Muzzy-Lyon Company, Detroit, manufacturer of babbitt metal and belt dressing; Michigan Lubricator Company, Detroit, manufacturer of lubricators; Detroit Leather Specialty Company, manufacturer of leather packing, &c.; Detroit Twist Drill Company, Detroit, manufacturer of machinists' tools; Wausau Sandpaper Company, Wausau, Wis.; Thomas Grate Bar Company, Birmingham, Ala.; Aurora Tool Works, Aurora, Ill.; Wm. O. Davey & Sons, Jersey City, N. J.; Cumberland Steel Company, Cumberland, Md.; Wolf Company, Chambersburg, Pa.; Elliott Company, Pittsburgh, Pa.; Canton-Hughes Pump Company, Canton, Ohio; Boston Belting Company, Boston, Mass.; Ellis-Watson Mfg. Company, Leicester, Mass.; Longmead Iron Company, Conshohocken, Pa.

The Associated Foundry Foremen of Philadelphia.—The fact that John Birkinbine, the well-known engineer, was to make an address on "The Early History of Iron Making" brought out one of the most representative gatherings that has ever attended the monthly meetings of the Associated Foundry Foremen of Philadelphia and Vicinity. The meeting was held in the Manufacturers' Club, Philadelphia, on the evening of February 14, president Clarence R. Brown occupying the chair. Mr. Birkinbine, in his address, took up the early manufacture of wrought iron in India, Asia and northern Africa, and carried his hearers by stages up to the present day methods of manufacture. In the early days, he said, there was no use for the foundry foreman, all the work being done in the forge, but we cannot praise too highly the pioneers whose efforts were beset with many difficulties, who blazed the way for the present methods and many uses to which iron and steel are applied.

New Publications

Elementary Practical Mechanics.—By J. M. Jameson. Bound in cloth. Size, 5 x 7¼ in.; pages, 321; 212 figures. Price, $1.60 net. Published by Longmans, Green & Co., Fourth avenue and Thirtieth street, New York City.

The book is an attempt to express practical mechanics as a science of the processes and structures of every day life, rather than a series of more or less abstract mathematical demonstrations. The text has been developed from a series of notes issued by the author for several years to his students. Nothing has been included which has not stood the test of several years' use with students in elementary technical courses, and the book is therefore well adapted for use in elementary, technical or manual training schools, requiring something between the usual text books in elementary mechanics, which are too theoretical or too mathematical, and the text books in general physics, which do not furnish a sufficiently complete and practical course. Where the course is to be followed by more applied ones in mechanism in engineering schools, this book can be used for an introductory course.

The subjects of work, friction and power transmission and tests of power brakes and dynamometers are discussed in considerable detail, and a chapter is devoted to elasticity and stress in materials. These parts of the book are supplemented by laboratory exercises and will furnish enough material for a short course in applied mechanics.

General principles and definitions to form the ground work for laboratory exercises are introduced early in the book, and a complete statement of the theory, together with its applications, is then developed through a combination of laboratory work and lectures. As a rule both the graphical and the analytical solutions are indicated in statics, so that if desired the use of trigonometric functions may be avoided without greatly modifying the ground covered. In those portions of the book which deal with the mechanics of moving bodies a special effort has been made to present the matter in a clear and usable form. The fundamental principle of these bodies is applied to familiar instances, such as the starting and stopping of trains, the tension of hoisting ropes, &c. In approaching the conception of moment of inertia and radius of gyration the familiar ideas of action and reaction and of moment of force are employed, rather than a more abstract mathematical reasoning.

Machine Shop Primer.—By Fred H. Colvin and Frank A. Stanley. Bound in cloth. Size, 6 x 9½ in.; pages, 148; 508 figures. Price, $1 net. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York City.

This book is an introduction to machine tools and shop appliances, with illustrations, names and definitions, and has been prepared to aid both students and instructors in acquiring a knowledge of the names of the machines, tools and appliances used in practical shop work. The book is divided into three sections. The first contains illustrations of machines, tools and machine shop appliances, so that the learner or apprentice can see what a tool looks like, and if desired this section can also be used as a sketch book. The next section gives the correct name of every part illustrated. As the proper spelling of the names and terms used are an essential part of this work, this division will be found to be a practical spelling book. Section III. is a very complete and convenient alphabetically arranged reference book on mechanical subjects. All the tools illustrated in section I. have a corresponding number to the references in this section.

Metal Statistics. Pages, 208; 3½ x 6 in.; cloth bound. Published by the American Metal Market Company, New York. Price, 50 cents.

The 1911 volume is the fourth issue of this excellent statistical handbook, and this is the third year in which iron and steel statistics have been included. These have been compiled by B. E. V. Luty, Pittsburgh, while the tables on nonferrous metals are the work of C. S. J. French. The iron ore tables include typical analyses of lake ores, shipments from Lake Superior mines and prices for a period of years. The pig iron statistics give standard analyses of foundry irons with prices of various irons in different markets for six years, while annual averages are given for 20 years. Finished products are covered quite completely with tables of prices and production. A new feature under this head is the "Composite Finished Steel" table. In this the various groups of finished products, apart from rails, are weighted according to their output. Bars, for example, constitute 2½ lb. out of a 10-lb. batch of finished steel, while plates, shapes, wrought pipe and wire are put at 1½ lb. each, sheets at 1 lb. and tin plate at ½ lb. The price of 1 lb. of the composite product is thus put at 1.74 cents as of January 1, 1911. There is also a "Composite Pig Iron" price table. A page is devoted to a graphic presentation of good and bad years in iron and steel, showing at a glance by the varying lengths of lines drawn to the right or to the left of the year whether it was good or bad, and how it compared in volume of production and in price with other years.

The George V. Cresson Company in Receiver's Hands

Webster King Wetherill was appointed receiver of the George V. Cresson Company, Philadelphia, Pa., by decree of the Common Pleas Court, in that city, February 9, and qualified by entering security in the sum of $500,000. The sole purpose of the receivership is the conservation and protection of the property of the company in the interest of the creditors and stockholders. By decree of the court the receiver is authorized to take charge of the property, assets, fixtures and contracts, and to enter into contracts necessary for the conduct and preservation of the business; with authority, if necessary, from time to time to sell such property as may be required for the payment of the creditors in full.

The difficulties of the company are believed to be but temporary. A large amount of work is on its books, sufficient to keep the plant engaged for some months, and it is understood that the business of the company will be continued by the receiver, and that it will not be long until its temporary difficulties will be fully adjusted.

The Chicago Foundry Foremen's Association.—The annual banquet of the Chicago Foundry Foremen's Association, which was held at the Sherman House on the evening of February 11, proved a highly successful event. Over 150 members and guests were present, including foundry proprietors and officials as well as foremen. Robert M. Thompson of Buffalo, N. Y., president of the American Foundry Foremen's Association, announced the arrangements that have been made for entertaining foundry foremen at the coming Pittsburgh convention. Herman Lange of the Ferguson & Lange Foundry Company, presented an interesting address on observations in the foundry. George Woodruff of Joliet, Ill., who has just returned from a trip of several months to South America, prior to which he made an extensive tour of the Orient, presented in an able manner the possibilities of foreign trade in foundry and machinery products, especially in Latin-American countries. Former United States Senator William E. Mason of Illinois, talked on American citizenship.

The North Range Iron Company is to be organized in March or April by George J. Maas, Negaunee, Mich., with a capital stock of $500,000, consisting of 100,000 shares of a par value of $5. Mr. Maas estimates that the mine which this company will operate has a deposit of easily 10,000,000 tons of Bessemer hard ore, averaging about 60 per cent. metallic iron and 0.045 per cent. phosphorus, and about 5,000,000 tons of soft hematite ore, both Bessemer and non-Bessemer, running 60 per cent. iron and 0.036 phosphorus to 55 per cent. iron and 0.237 per cent. phosphorus.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 15, 1911.	Feb. 8, 1911.	Jan. 18, 1911.	Feb. 16, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$18.75
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.00
Foundry No. 2, Birmingham, Ala.	11.00	11.00	11.00	13.75
Foundry No. 2, local, Chicago	15.50	15.50	15.50	19.00
Basic, delivered, eastern Pa.	14.50	14.50	14.25	18.50
Basic, Valley furnace	13.75	13.75	13.25	16.25
Bessemer, Pittsburgh	15.90	15.90	15.90	18.90
Gray forge, Pittsburgh	**14.40**	14.15	14.15	16.90
Lake Superior charcoal, Chicago	17.50	17.50	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	28.00	28.00	32.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	30.60
Wire rods, Pittsburgh	29.00	29.00	28.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	**15.50**	14.50	14.50	19.00
Iron rails, Philadelphia	**17.50**	17.00	17.00	20.00
Car wheels, Chicago	13.00	13.00	13.00	17.50
Car wheels, Philadelphia	**13.50**	13.00	13.00	16.75
Heavy steel scrap, Pittsburgh	**14.50**	13.75	13.50	17.25
Heavy steel scrap, Chicago	**11.75**	11.50	11.50	15.25
Heavy steel scrap, Philadelphia	**14.00**	13.00	12.50	16.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	**1.35**	1.20	1.32½	1.60
Common iron bars, Chicago	1.30	1.30	1.30	1.60
Common iron bars, Pittsburgh	1.35	1.35	1.35	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.30	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.75	1.75	1.70	1.85
Cut nails, Pittsburgh	1.60	1.60	1.60	1.80
Barb wire, galv., Pittsburgh*	2.05	2.05	2.00	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	13.75
Electrolytic copper, New York	12.37½	12.37½	12.50	13.50
Spelter, New York	**5.57½**	5.50	5.55	5.60
Spelter, St. Louis	**5.42½**	5.30	5.40	5.45
Lead, New York	4.45	4.45	4.50	4.55
Lead, St. Louis	4.30	4.30	4.35	4.40
Tin, New York	**45.75**	40.12½	41.75	33.20
Antimony, Hallett, New York	7.75	7.75	7.87½	8.25
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel, Black.	Steel, Galv.	Iron, Black.	Iron, Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

THE IRON AND METAL MARKETS

Plugged and Reamed.

1 to 1½, 2 to 3 in...	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.....	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.....	49	43
1¾ to 2¼ in.....	61	43
2½ in.....	63	48
2¾ to 3 in.....	69	55

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2½ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $29.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, February 15, 1911.—(*By Telegraph.*)

Pig Iron.—There is more inquiry for pig iron than for some time, the tone of the market is firmer and the advance in prices on basic is being held. The American Steel Foundries has bought upward of 6000 tons of basic for its works at Alliance, Ohio, and while the price on this iron is understood to have been about $13.25 at Valley furnace, it is explained by the fact that the company got options on the iron before the recent advance took place. The United Steel Company, Canton, Ohio, has bought 1000 tons of basic for March and 2000 for April at $13.50, Valley furnace. The absolute minimum on basic iron to-day is $13.75, Valley furnace, and most furnaces are holding for $14. A sale is reported of 1250 tons of standard Bessemer iron, deliveries 250 tons a month, February to June, at $15, Valley furnace. Five or six blast furnaces in the Pittsburgh district have blown in since the first of the month. We quote Bessemer pig iron, $15; malleable Bessemer, $13.75; basic, $13.75; No. 2 foundry, $13.75, and gray forge, $13.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—This week all of the 54 open hearth furnaces at the Homestead Works of the Carnegie Steel Company are in operation, for the first time in some months. Inquiries for billets and sheet and tin bars are better and prices are firm. The report of a sale of 2000 tons of open hearth sheet bars at $25, Pittsburgh, the sale being credited to the Cambria Steel Company, is absolutely and officially denied. There is no occasion as yet for consumers to pay premiums for either Bessemer or open hearth steel, as the supply is ample. We note a sale of 2000 tons of open hearth sheet bars, for delivery over the next three months, at $24, Pittsburgh, and also a sale of 2200 tons of high carbon forging billets at $31, delivered Cincinnati, or $29, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24 and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

The improved conditions noted in this report for several weeks continue. Actual orders going to the mills for rolling are heavier than for some months. This is shown by the increase in operations among the large steel concerns and the blowing in of a number of additional blast furnaces. The Cambria Steel Company is operating this week its entire open hearth department, comprising 25 furnaces, and running six out of eight blast furnaces, and started on Monday its 134-in. plate mill, which has been closed down for a week or more for lack of orders. The Carnegie Steel Company is increasing operations at nearly all its steel plants and has blown in five or six blast furnaces this month. The new demand for plates, structural steel, tin plate, sheets and wire products is heavier than for some time and promises further increase. Some quite large orders for line pipe have been placed and the pipe mills are getting busier.

Ferromanganese.—The market is weak, with very little new inquiry. Most consumers are pretty well covered for some time ahead. Sales are reported of two cars, or 60 tons, for spot delivery, on the basis of $37.50, Baltimore, the freight rate to Pittsburgh being $1.95 a ton. We quote 80 per cent. foreign ferro at $37.50 to $37.75, f.o.b. Baltimore, for prompt shipment.

Ferrosilicon.—The leading local consumer has bought through a New York house 5000 tons of 50 per cent. ferrosilicon, for delivery over this year. This deal has been hanging for some time and was closed on Monday. The price paid is not stated, but is understood to have been relatively low. We quote 50 per cent. at $54.50, Pittsburgh, for delivery within the next three or four months. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Muck Bar.—No new inquiry is in the market, and in the absence of sales we quote best grades of muck bar made from all pig iron at $30, delivered in Pittsburgh district. Higher prices are being quoted on mill iron, and the few makers of muck bar have advanced prices. The muck bar plant of the Kittanning Iron & Steel Company, Kittanning, Pa., containing 33 furnaces, is expected to start up February 20. It has been shut down for some months.

Skelp.—Prices on the different grades of skelp are firmer than for some time, and the mills have more tonnage on their books. One local maker of grooved and sheared iron bars is reported to have its product sold up for the next three months. A sale is reported of 2000 tons of sheared iron plates at about 1.77½c., Pittsburgh, Pa. We quote grooved steel skelp at 1.30c., sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Wire Rods.—The market on rods is firmer than for some time, and leading makers are now holding Bessemer and open hearth rods firm at $29, Pittsburgh. The new rod mill of the Jones & Laughlin Steel Company at Aliquippa is making some records for output, while the Cambria Steel Company, Johnstown, Pa., is turning over its new rod mill to-day (Tuesday). This is a Morgan double strand mill and will have a daily capacity of about 350 tons. We quote Bessemer and open hearth and chain rods at $29, Pittsburgh, and note a sale of 300 tons of Bessemer rods for March and April delivery at that price.

Steel Rails.—The Carnegie Steel Company has taken a contract for 500 tons of standard sections for a prominent line in Ohio, but aside from this has not entered any large orders. There is some buying of light rails, the Carnegie Steel Company having received new orders and specifications in the past week for about 2200 tons. The lumber interests are now making inquiries for light rails for delivery commencing May. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—As orders for steel cars have been light for some time, the plate mills are naturally short of work, but general conditions are showing a slight betterment. The Riter-Conley Mfg. Company has received contracts for gas holders from the Minneapolis Gas Light Company, Minneapolis, Minn., and Laclede Gas Light Company, St. Louis, Mo. These will take about 5000 tons of plates, which will be rolled by the Carnegie Steel Company. No orders for steel cars have been placed in the past week, but it is probable that the contract of the Wabash-Pittsburgh Terminal Railroad for 1000 will be given out this week. The contract for a large riveted pipe water line requiring a heavy tonnage of plates is about ready to be closed. The market on plates is firm and we quote ¼-in. and heavier at 1.40c., Pittsburgh.

Structural Material.—Inquiries are more numerous, but local structural concerns report that very little actual business has been placed in the past week. Bids have gone in for a pier shed at New Orleans, 1500 tons, while the Panama Canal Commission is in the market for 12,000 tons for emergency dams and other work on the canal, bids for which are to be opened about March 15. The McClintic-Marshall Construction Company has taken a contract for the erection of a steel building for the Linde Air Products Company at North Trafford, Pa., about 150 tons, and has a contract from the same company for a similar building at South Elizabeth, N. J. Local work in the market includes 200 tons for the Colfax School and also for the new foundry buildings of the Westinghouse Electric & Mfg. Company at Trafford City, Pa., about 2000 tons. This latter work is likely to be placed in a short time. The market is firm and we quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

THE IRON AND METAL MARKETS

Tin Plate.—Conditions in the tin plate trade are referred to by the manufacturers as being very satisfactory. The American Sheet & Tin Plate Company is operating this week 200 out of 235 hot tin mills, or about 85 per cent. of capacity. The company has recently started up 30 hot tin mills in its Shenango Works and 18 out of 20 hot mills at its New Castle Works. The larger independent tin plate concerns report they are operating to from 80 to 90 per cent. of capacity. Specifications against contracts are coming in very liberally. The recent advance of 10c. a box is being absolutely maintained, and we quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Sheets.—Conditions in the sheet trade are steadily showing betterment, the new demand being heavier and specifications against contracts coming in more freely than for some time. The American Sheet & Tin Plate Company is operating to about 65 per cent. of capacity, a considerable increase over its operations of a month ago. It is stated that prices are being firmly maintained. The full schedule of prices in effect on the different grades of sheets is printed on a previous page.

Bars.—The situation in both iron and steel bars is somewhat disappointing, the new demand being light, while specifications against contracts are not coming in at a very satisfactory rate. The capacity for making steel bars has been heavily increased in the past year or two, and it would seem that for the present at least it is somewhat ahead of consumption. None of the makers of steel bars is operating to full capacity, and some report that they are running to only about 50 per cent. We quote steel bars at 1.40c. and iron bars at 1.35c. to 1.40c., in carload and larger lots, f.o.b. Pittsburgh.

Hoops and Bands.—The new demand for both hoops and bands is fair, consumers placing orders only to cover actual needs. Specifications against contracts are being received by the mills in moderate volume. We continue to quote hoops at 1.50c. and bands at 1.40c., in carload and larger lots, the latter carrying extras as per the steel bar card of September 1, 1909. We may note that on some specially desirable contracts placed recently the price of steel hoops was 1.45c. and steel bands 1.35c.

Spikes.—All the makers of spikes are badly in need of more business. It is stated that the new prices adopted February 1 are being firmly held and are as follows:

Railroad Spikes.

4½, 5 and 5½ x 9/16	$1.55
3, 3½, 4, 4½ and 5 x ½	Extra .10
3½, 4 and 4½ x 9/16	Extra .20
3, 3½, 4 and 4½ x ⅝	Extra .30
2½ x ⅝	Extra .40
2½, 3 and 3½ x 9/16	Extra .60
2 x 9/16	Extra .80

Boat Spikes.

¾ in. square, 12 to 24 in. long	Extra .15
¾ in square, 8 to 16 in. long	Extra .15
½ in. square, 6 to 16 in. long	Extra .15
7/16 in. square, 6 to 12 in. long	Extra .20
⅝ in. square, 4 to 12 in. long	Extra .30
9/16 in. square, 4 to 8 in. long	Extra .45
¼ in. square, 4 to 8 in. long	Extra .75
¼ in. square, 3 to 3½ in. long	Extra 1.00

⅝ and 9/16 shorter than 4 in., ¼ cent extra.

Spelter.—The market continues quite firm, and inquiries are reported as considerably better. We quote prime grades of Western at 5.27½c., East St. Louis, equal to 5.40c., Pittsburgh.

Merchant Steel.—New orders are small, but specifications against contracts so far this month have been fully as heavy as in the first half of January. Prices are firm and we quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—Consumers are placing orders only for small lots and specifications against contracts are not coming in at a very satisfactory rate. Regular prices of 1.90c. on structural rivets and 2c. on boiler rivets are sometimes shaded on desirable orders.

Wire Products.—New buying in wire nails and wire is rather light, but jobbers and consumers are specifying liberally against contracts. Shipments of wire products by the mills in February promise to be considerably heavier than last month. We quote galvanized barb wire at $2.05, painted $1.75, annealed fence wire $1.55, galvanized $1.85, wire nails $1.75 and cut nails $1.60, in carload and larger lots, all f.o.b. Pittsburgh, full freight to point of delivery added.

Merchant Pipe.—The Eastern Oil Company has placed a contract with the Mark Mfg. Company for about 25 miles of 12-in.pipe. Some fairly large inquiries for pipe for gas and oil lines are in the market. The Tri-State Natural Gas Company is inquiring for about 70 miles of pipe, from 3 up to 10 in. The general demand for merchant pipe is fairly good, and some of the larger pipe mills are running at a fuller rate of capacity than for some time. The National Tube Company recently started up two more of its blast furnaces and reports a considerable increase in orders. Discounts on iron and steel pipe printed on a previous page are reported as being fairly well maintained.

Boiler Tubes.—The boiler tube trade is still in unsatisfactory condition, the demand for both locomotive and merchant tubes being very dull, with prices more or less shaded, depending on the order.

Coke.—There is a little better feeling in the coke trade, due to the starting up of a large number of ovens of the H. C. Frick Coke Company and other coke concerns who sell a good part of their product to the blast furnace trade. The output of coke last week in the Upper and Lower Connellsville regions was 302,275 net tons, a gain over the previous week of about 11,000 tons. Prices on coke are reported to be slightly firmer. We quote standard makes of furnace coke for spot shipment at $1.45 to $1.55 per net ton, at oven; on contracts for delivery over the year from $1.70 to $1.75 is being quoted by some coke operators, while others are firm, at $1.90 to $2, at oven. Best makes of 72-hour foundry coke are being held at $2.10 to dealers and from $2.25 up to $2.50, at oven, to consumers.

Iron and Steel Scrap.—There has been a radical change in conditions in the scrap trade in the past week or two, the demand being very much heavier, while prices have advanced. It is claimed that there is a decided shortage in the supply, and dealers are afraid to sell ahead. The offerings in the recent list of the Pennsylvania Railroad were largely taken up by consumers, who paid higher prices than for some time. Sales have been made of 3000 to 4000 tons of heavy steel scrap at $14.25 and up to $14.50, or higher, delivered at Monessen, Pa., or Steubenville, Ohio. An Eastern steel company has recently bought 12,000 tons of detinned scrap and about 5000 tons of bundled sheet scrap. A sale is also noted of about 1000 tons of bundled sheet scrap at $11 at loading point. It is stated that sales of heavy steel scrap have been made as high as $14.50 and $14.75, delivered, and that offers of $15 for upward of 20,000 tons for delivery up to July or August have been turned down. Dealers have advanced prices and now quote as follows, per gross ton, f.o.b. Pittsburgh, or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.50 to $14.75
No. 1 foundry cast	13.75 to 14.00
No. 2 foundry cast	13.00 to 13.75
Bundled sheet scrap, at point of shipment	10.75 to 11.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	14.75 to 15.00
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.00 to 11.25
Low phosphorus melting stock	17.00 to 17.25
Iron car axles	24.50 to 24.75
Steel car axles	20.25 to 20.50
Locomotive axles	24.00 to 24.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.25 to 8.35
Machine shop turnings	8.75 to 9.00
Old iron rails	16.00 to 16.25
No 1 wrought scrap	14.50 to 14.75
Heavy steel axle turnings	10.25 to 10.50
Stove plate	11.50 to 11.75

Chicago

FISHER BUILDING, February 15, 1911.—(*By Telegraph.*)

Railroad buying has not yet assumed any large proportions and other large consumers of steel still show a spirit of hesitation. No additional important rail orders are reported, but a large tonnage of track fastenings has been booked and the manufacturers of car fittings are getting more satisfactory business. In the lighter finished materials wire products are maintaining the lead, with sales running in excess of the normal daily average. On the other hand the improvement in bars and sheets is slow. The mills are getting better specifications for structural shapes and plates from the good contracts that have been let the past month, but there is still a considerable distance to go before normal conditions will be reached. The pipe foundries report that municipal lettings since the first of the year have exceeded the average rate for this period and the business in prospect will make a good showing for February. The general feeling in the trade is optimistic and prices are firm. The scrap market is more active than it has been for more than a year and dealers are bidding higher prices, especially for railroad scrap.

Pig Iron.—The leading harvester interest has been a heavy buyer of both Northern and Southern pig iron the

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past week. Its purchases are estimated at over 100,000 tons for various deliveries extending through and beyond the third quarter. Large blocks of iron from furnace stocks at both Northern and Southern furnaces are included and it is expected that this will materially relieve the pressure among Southern furnace interests to move their stocks. The Northern pipe foundry interest which was mentioned last week has also been an extensive buyer for second and third quarter for delivery at foundries in central Ohio. Several round lots have been purchased from furnaces in the valleys and southern Ohio and also from a leading Birmingham interest. The total taken by this pipe foundry interest is around 50,000 tons. There has been thus far no general buying movement by foundries or manufacturing interests in the West, although several fair lots of both Northern and Southern iron have been closed. There have been many inquiries for Southern iron for third quarter from buyers who offer to take a fair proportion for prompt shipment at $11, Birmingham, if they could obtain the same price for third quarter, but the Southern furnaces have been very firm in resisting temptation on these offers. The malleable foundries have not succeeded in purchasing from local furnaces for last half, and it is understood that the closing of contracts with annual buyers of castings will be deferred for some weeks until the furnace interests are willing to make prices on the iron. The following quotations are for February and March shipment, Chicago delivery:

Lake Superior charcoal	$17.50 to $18.00
Northern coke foundry, No. 1	16.00 to 16.50
Northern coke foundry, No. 2	15.50 to 16.00
Northern coke foundry, No. 3	15.25 to 15.75
Northern Scotch, No. 1	16.50 to 17.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	15.50 to 16.00
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%	18.90 to 19.40
Jackson Co. and Kentucky silvery, 10%	19.90 to 20.40

Rails and Track Supplies.—The local mills have sold a large tonnage of track fastenings the past week, supplementary to recent orders for rails, but no new orders of moment are reported for standard rails. There are many inquiries from minor Western railroads for small lots of standard sections. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

(By Mail.)

Billets.—Prices of billets have been a subject of discussion among the steel manufacturers for some time, but no improvement is expected as long as independent mills are short of orders on finished materials. Western buyers of forging billets are buying open hearth billets exclusively. Independent Eastern mills are selling for Chicago delivery at prices around $28, base, Chicago, but the leading interest continues to hold at $31.

Structural Material.—Additional construction for the Corn Products Company at Argo, near Chicago, amounting to about 2800 tons, was let to the Joliet Bridge & Iron Works. A viaduct at Des Moines, Iowa, 1300 tons, on which bids were taken by the Chicago, Burlington & Quincy Railroad, was let to the Des Moines Bridge & Iron Works. A bridge over the Arkansas River at Fort Smith, 4400 tons, was let to the American Bridge Company. A building for Harned & Von Maur, Davenport, Iowa, 250 tons, was awarded to the Morava Construction Company, Chicago. The mills are getting better specifications for plain material, growing out of the contracts let the past month, and prices are very firm. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Orders from the railroads for repair work on steel cars are becoming an important item in the plate trade. Specifications for tank and boiler plates are also coming in better than in December or January. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Specifications are improving slowly, but are still far short of the capacity of the mills. Prices are reported firm. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The bar trade is slow in swinging into line. Iron bars are stronger and the mills are disposed to decline 1000 ton contracts running four or five months ahead, as scrap is advancing, and the present market price is unprofitable. In steel bars new business continues very light, but the concrete bar season will open soon and the mills already have good scattering inquiries. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.30c. to 1.35c.; hard steel bars rolled from old rails, 1.35c. to 1.40c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—Specifications from the hardware and agricultural trade are in excess of the capacity of the mills, but it is not expected that the buying movement will result in any serious delay in making shipments. No changes are reported in prices. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.73c.; wire nails, 1.93c.; painted barb wire, 1.93c.; galvanized, 2.23c., all Chicago.

Cast Iron Pipe.—The leading pipe foundry interest was awarded 3200 tons of water pipe and 700 tons of pipe for filtration plant at Minneapolis last week. Good lettings are expected this month from Milwaukee, St. Louis and other Western cities. Prices are reported 50 cents a ton higher. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $25.50; 6 to 12 in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Merchant Steel.—The mills are making normal shipments to the agricultural trade, the season for new specifications in this line being about over.

Old Material.—A strong speculative movement is under way among dealers in old material. Bids on railroad lists are running 25c. to $1 per ton higher than January prices. A railroad which offered about 25,000 tons on a list which closed last week rejected all bids and will hold its scrap for higher prices. A buyer who inquires for a round tonnage would have to pay considerably higher prices than current quotations, which are based on actual sales to consumers for spot or prompt delivery, usually in odd lots of a few cars. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered Chicago:

Old iron rails	$15.50 to $16.00
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.75 to 12.25
Frogs, switches and guards, cut apart	11.75 to 12.25
Shoveling steel	11.25 to 11.75

The following quotations are per net ton:

Iron angles and splice bars	$13.50 to $14.00
Iron arch bars and transoms	15.00 to 15.50
Steel angle bars	11.25 to 11.75
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Steel knuckles and couplers	11.25 to 11.75
Locomotive tires, smooth	17.50 to 18.00
Steel axle turnings	7.75 to 8.25
Machine shop turnings	6.75 to 7.25
Cast and mixed borings	5.50 to 6.00
No. 1 busheling	9.50 to 10.00
No. 2 busheling	7.50 to 8.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	12.00 to 12.50
Stove plate and light cast scrap	10.50 to 11.00
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.00 to 10.50
Pipes and flues	8.75 to 9.25

Philadelphia

PHILADELPHIA, PA., February 14, 1911.

The recent improvement in the demand appears not only to have been fully maintained but has also resulted in increasing inquiry from consumers. Finishing mills in this district are gradually increasing the productive rate and a number are now operating at 75 per cent. of full capacity. Prices of finished materials are all being well maintained and producers are not interested in business of a forward nature. In pig iron a fair amount of buying in foundry grades continues and further quiet sales of basic iron, at $14.50, have come out, although an advance of 50c. is now pretty generally asked. Statistics regarding the Eastern pig iron situation are more favorable, recent reports of the Eastern Pig Iron Association showing an increase in unfilled orders, with stocks on hand practically stationary. The old material market has stiffened sharply, and prices of the principal grades show an advance over recent quotations.

Iron Ore.—Offerings for this year's supply are being freely made, both in foreign and domestic ore. While sellers are inclined to be in no haste to place business, some very satisfactory amounts of Spanish ore have been sold, although

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sellers withhold particulars at the time. Importations at this port in the week ending February 11 totaled 11,179 tons, valued at $48,087.

Pig Iron.—While last week's transactions will probably not aggregate as large a tonnage as the previous week, owing to the smaller number of large blocks sold, there has been a very fair general business, and furnacemen feel encouraged with the prospects for the future. Basic transactions have quieted down, although information of two recent sales of 5000 tons each, at $14.50, delivered, for shipment in the next 60 days, has come out. Consumers are now more fully supplied as to near future requirements and for the time are awaiting developments. Producers in this district have practically all advanced their asking price for this grade, either for early or second quarter shipment, to $15, delivered, but no business has been done on that basis. Moderate sales of low phosphorus iron, for early shipment, at prices ranging from $21 to $21.50, with one large lot for Western shipment, deliveries over the remainder of the year, at a somewhat higher comparative price, are reported. The movement in foundry grades has been fairly active, and consumers are inquiring freely for quantities varying from 100 to 500 tons, for near future delivery, as well as for shipment during the second and, in some instances, the third, quarter. For early delivery prices for standard brands of No. 2 X foundry are very firm, at $15.50 to $15.75, with one seller holding at $16, delivered, but for shipment beyond the second quarter sellers are not prepared to quote. Transactions have for the most part been confined to small lots. Cast iron pipe makers are still negotiating for further supplies of low grade iron, but no important sales have been announced. Somewhat better sales of Virginia foundry iron are noted, and while $13, furnace, has been the leading producer's price for No. 2 X foundry for delivery over the remainder of the first half, that interest has withdrawn that quotation and now names $13, furnace, for February-March shipment, and $13.50 for second quarter. The bulk of the recent orders has been for delivery over three and four months, at $13, furnace, for either No. 2 X or No. 2 plain grades, equal to $15.80 to $16, delivered in this district. Southern iron is being offered at $11, Birmingham basis, for No. 2, equal to $15.20 to $16, delivered, according to destination, in this territory, but practically no business is being done. Forge iron has been in somewhat better demand, several 1000 tons, as well as smaller lots, being inquired for, but buyers and sellers appear to still be somewhat apart in their ideas of prices. The general range of prices shows no change. For delivery in buyers' yards in this vicinity quotations for standard brands are about as follows:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.50
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.25
Basic	14.50 to 15.00
Standard low phosphorus	21.00 to 21.50

Ferromanganese.—The market is quiet, but one small inquiry being reported in this district. For prompt shipments as low as $37.50, Baltimore, can in instances be done for 80 per cent. ferro, but for extended delivery sellers are holding pretty firmly at $38, Baltimore.

Billets.—Consumers, while making inquiries for forward requirements, usually place orders for small and moderate lots for prompt and near future delivery. The volume of business is somewhat larger, but mills, while operating on a better basis, are not booked very far ahead. Reports of lower prices for standard open hearth billets are heard, but cannot be confirmed. Leading producers maintain the $23, Pittsburgh, base, with $2.40 freight to this district, or $25.40, delivered, for open hearth rolling billets, and $30.40, delivered, for ordinary forging billets.

Plates.—The recent gains in the volume of business coming to the mills has been fully maintained. Orders are not particularly large individually, but there is a good number of moderate and small orders, which in the aggregate have enabled mills to attain a productive rate varying from 65 to 75 per cent. of full capacity, and the outlook for continuing at this improved rate is believed to be encouraging. Eastern mills are maintaining prices firmly at 1.55c. minimum for ordinary plates for early delivery in this vicinity.

Structural Material.—The demand does not show the same immediate improvement that is to be noted in some of the other lines. Current orders are mostly small. Several larger building propositions are pending, in instances practically closed, although formal contracts have not been signed. Mills are a trifle more actively engaged, and prices are well maintained at 1.55c. minimum for plain shapes, although for fabricated work, on which there is sharp competition, prices are understood to be weak.

Sheets.—The situation is unchanged; orders are coming out freely, but are usually for small lots for early shipment, and mills' order books are not in very satisfactory shape as far as the future is concerned, although current orders keep them fully occupied. The following range of prices is named by Eastern mills: For early deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand is a trifle better, particularly for refined iron bars. Prices of steel bars are very firm, leading producers holding 1.55c., delivered here. A stronger position has developed in refined iron bars, and some of the Eastern mills have withdrawn recent low quotations. While a basis has not been firmly established, a minimum of 1.30c. mill is anticipated. Prompt desirable business has been done at a shade less, although for ordinary specifications 1.35c. to 1.40c., delivered here, about represents the market.

Coke.—Current business is light, consumers confining purchases, as a rule, to prompt lots, which are usually available at lower prices than for moderate forward delivery. Sellers are not disposed to contract for extended delivery at the present range of prices. For reasonably early shipment foundry coke commands from $2 to $2.25 per net ton, at oven, according to grade, but for prompt shipment $1.90 has been done. Furnace coke for spot shipment ranges from $1.40 to $1.55, at oven, with $1.55 to $1.65 representing about the market for forward deliveries. The following range of prices about represents the market, per net ton, for near future deliveries in this vicinity:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.25 to 4.50
Mountain furnace coke	3.35 to 3.50
Foundry coke	3.85 to 4.10

Old Material.—The market, while not particularly active, has developed a decidedly higher range of prices. This has been due in a measure to a higher market in other districts, to which material has been diverted, and also the increasing interest shown by consumers in this territory. Bids for railroad offerings were in instances above the recent high level of quotations, without resulting in business, and it is believed that the railroads are withholding a large part of their recent offerings. While some mills are offering $13.50 for No. 1 heavy melting steel, no quantity is available at that price, and higher prices have been paid for moderate lots for early delivery. Rolling mill grades are higher, and the market in nearly all classes of material is decidedly stronger. Few sellers are willing to dispose of holdings at current quotations, the disposition being to await still higher prices. The following range about represents the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap	$14.00 to $14.50
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 18.50
Old steel axles	20.50 to 21.00
Old iron axles	26.00 to 27.00*
Old iron rails	17.50 to 18.00
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.25 to 16.50
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.75 to 12.25
No. 2 light iron	7.00 to 7.50*
Wrought turnings	9.50 to 10.00
Cast borings	9.00 to 9.50
Machinery cast	14.50 to 15.00
Railroad malleable	12.00 to 12.50
Grate bars	11.00 to 11.50
Stove plate	10.00 to 10.50

* Nominal.

Cincinnati

CINCINNATI, OHIO, February 15, 1911.

Pig Iron.—Apparently the trade is waking up, as inquiries are increasing. The amount of business booked also is very encouraging when compared with nearby weeks. Orders, however, rarely call for more than 500 tons, and for first half shipment. No business is reported for the third quarter or last half as the furnaces are withholding quotations for this delivery. Many consumers have expressed a willingness to cover for the last half at prevailing prices, but thus far have been unable to get the producers to meet their views. High silicon iron appears to be in demand, but the largest actual sale to be recorded is a lot of about 400 tons for an Ohio melter. An Illinois firm wants about 3000 tons of analysis iron, for shipment from March to September. A Michigan concern is also inquiring in this market for about 2500 tons of Southern foundry for last half delivery. A central Ohio company is asking for 6000 tons of basic, and another consumer in the same territory wants 1200 tons of Northern No. 2 foundry for March to June delivery. A nearby agricultural implement manufacturer has out an inquiry calling for a miscellaneous lot of analysis iron, the amount totaling about 2700 tons. It has been reported that a few lots of Southern foundry No. 2 have lately changed hands at a price below $11 for prompt shipment, but upon

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investigation it is found that these sales either covered iron not quite up to grade or that there were special conditions governing the transaction such as a division of commissions or of the differential in freight rates. We quote Northern No. 2 foundry and malleable at $14, Ironton, with not much demand for the latter, and Southern No. 2 foundry at $11, Birmingham. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry	$14.75
Southern coke, No. 2 foundry	14.25
Southern coke, No. 3 foundry	13.75
Southern coke, No. 4 foundry	13.50
Southern coke, No. 1 soft	14.75
Southern coke, No. 2 soft	14.25
Southern gray forge	13.00
Ohio silvery, 8 per cent. silicon	18.20
Lake Superior coke, No. 1	15.70
Lake Superior coke, No. 2	15.20
Lake Superior coke, No. 3	14.70
Standard Southern car wheel	25.25
Lake Superior car wheel	19.50

Coke.—Local agencies are working on an inquiry for about 7000 tons of furnace coke for shipment in the next two or three months, and 3000 tons is wanted by another consumer for distribution through the remainder of the first half. In the Connellsville district furnace coke is quoted at $1.50 per net ton at oven for prompt shipment, with a premium of 10c. to 20c. on contracts. In the Wise County and Pocahontas fields both the spot and future shipment price is from 10c. to 15c. higher. Foundry coke is inactive in all three fields, and is quotable at $2 to $2.15 per net ton at oven for prompt shipment, and around $2.25 for future delivery.

Finished Material.—In practically every line there is a steady increase in both inquiries and orders. Steel bars and railroad track material are moving very freely, as compared with last month. The mill price of 1.40c., Pittsburgh, is being strictly maintained in this market. Warehouse figures are around 1.80c. to 1.95c. The demand for structural material also shows some improvement.

Old Material.—There has been a little buying on the part of the rolling mills lately, but the foundries are slow in taking on any stocks. In comparison with pig iron prices, prevailing scrap figures in this market are considered rather stiff, but there does not seem to be any weakening on the part of dealers. Most of them have yards well stocked up. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	5.00 to 5.50
Steel turnings, net ton	6.00 to 6.50
No. 1 cast scrap, net ton	11.00 to 11.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Busheled sheet scrap, gross ton	8.50 to 9.00
Old iron rails, gross ton	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton	21.50 to 22.50
Old car wheels, gross ton	12.00 to 12.50
Heavy melting steel scrap, gross ton	11.00 to 11.50

The accounting departments of all outside offices of Hickman, Williams & Co. are being moved to Cincinnati, Ohio, and in the future that city will practically be the head office for this firm.

Cleveland

CLEVELAND, OHIO, February 14, 1911.

Iron Ore.—Indications point to a late opening of the ore shipping season this year. Some of the managers of independent boats are planning not to place their vessels in commission until June or later. Last year so many boats were started out early in the season that there were not cargoes enough to go round, and quite a number of the independent boats were sent to the docks early in the summer. Nothing has been done as yet in regard to fixing ore carrying rates for the season. Ore firms have not yet taken up the question of prices. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—Following the advance in the price of basic iron, prices have stiffened up somewhat on foundry grades and some of the Valley furnaces that have been quoting No. 2 foundry at $13.75 and under are now holding firmly at $14, but the $13.75 price has not entirely disappeared. One local interest is now holding basic at $14, and another has advanced its price to $14.50. A firm offer of $13.50 for a round lot of basic was rejected by two Cleveland furnaces during the week. The United Steel Company, Canton, Ohio, is understood to have closed for 3000 tons of basic for which it had inquiries out last week. Among the new inquiries is one for 5000 tons of basic. The foundry iron market is quiet, the only sales reported being a few small lots. A local furnace has sold 500 tons of No. 2 foundry at $14, at furnace, for northern Ohio delivery, and 500 tons of malleable at $13.75. An Erie consumer has bought 300 tons of foundry. A broker is out with an inquiry for 7000 tons of analysis foundry iron. A Mansfield implement concern is in the market for 300 tons of foundry. A development of the week was the appearance of a number of small inquiries for foundry iron for last half delivery. Some buyers would doubtless be glad to contract for the last half at current prices, but sellers do not seem disposed to quote for delivery beyond the second quarter, and especially in view of the fact that it is likely to be some time until they know what their ore is going to cost them this year. For prompt shipment and the first half we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	14.00
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—The only transaction of any size reported during the week was the sale of 7000 tons of furnace coke to a local consumer for March delivery. Prices are slightly firmer, some of the low sellers having advanced quotations 5c. a ton on furnace grades. We quote standard Connellsville furnace coke at $1.45 to $1.55 per net ton for spot shipment, $1.60 to $1.65 for the first half and $1.75 to $1.80 for the entire year. Connellsville 72-hour foundry coke is held at $2 to $2.15 for spot shipment and $2.25 to $2.50 for the first half.

Finished Iron and Steel.—The demand for nearly all finished lines shows further improvement. A large number of small orders came out during the week and some for fair sized tonnages, and the general report is that the situation is growing better. A number of contracts have been placed in the past few days for steel bars, plates and shapes for first half delivery. While sellers are not disposed to make contracts beyond July 1, one consumer is understood to have succeeded in placing a steel bar contract until October 1. A good volume of steel bar specifications is coming from the implement trade and other users. The demand for plates is picking up, a larger volume of orders coming from the boilermakers. The demand for tank plates is not active. Structural orders for small lots have improved, but large inquiries are lacking. The demand for steel bars for concrete reinforcing, which has been inactive for some time, has become fairly good with the approach of spring and is expected to be quite heavy within a few weeks. Prices on steel bars, plates and structural material are firm. The demand for sheets has improved and prices are being firmly maintained. Railroad orders are improving, some good business having developed in track fastenings. The demand for shafting continues good. Rivet orders are not plentiful and regular quotations continue to be shaded $2 a ton except for small lots. The demand for iron bars shows a fair improvement. The minimum quotation of 1.30c. at mill, is being firmly maintained.

Old Material.—The feeling among dealers continues very firm and the recent advances in prices are being generally maintained. Mills still have good sized stocks on hand, so that actual orders are rather light. Some of the consumers desire to contract for April and May delivery, but dealers believe that prices will further advance and are unwilling to make contracts. The Norfolk & Western and the Michigan Central railroads have lists out to close February 16. The list of the latter road includes 2500 tons of iron and steel rails and 1400 tons of short ends of rails. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	15.50 to 16.00
Steel car axles	19.00 to 19.50
Heavy melting steel	12.50 to 13.00
Old car wheels	12.50 to 13.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	11.50 to 11.75
Railroad malleable	12.75 to 13.00
Light bundled sheet scrap	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 cast	12.00 to 12.50
Stove plate	10.00 to 10.50
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., February 13, 1911.

Pig Iron.—Several cross-currents have been encountered in this market the past week, but without having affected quotations. It is widely reported that a leading agricultural implement interest succeeded in obtaining approximately 25,000 tons of foundry iron for delivery over the next five

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months, at a concession from the $11, Birmingham, schedule, but the details are not given out. A lot of 1500 tons for shipment in 90 days was sold at the $11 schedule, and an aggregate of some 3500 tons in comparatively small lots is also reported sold at that price. The supply of foundry grades below No. 4 foundry has to all appearances been exhausted, and small lots of 4 to 5 per cent. silicon iron are bringing from $12 to $12.50, at furnace. The demand for these last named grades is very good, while the general inquiry from the largest consumers of all grades during the week indicates that a significant tonnage for nearby requirement is yet to be engaged. The strongest feature of the situation at this time is the fact that the production is less than the actual movement. Practically no gain in the accumulation of any grades on furnace yards was made during the month of January, and there is as yet no tangible evidence of any addition to be made to the active producing capacity at an early date. Another large producing interest has recently withdrawn from the market for any deliveries, and those who are soliciting additional orders are still unwilling to commit themselves for anything beyond the first half. It seems reasonably certain that with a stronger market for Northern irons the situation in the South would improve very materially.

Cast Iron Pipe.—No lettings of consequence were made the past week, and the tonnage represented by the small orders was probably less than for the week previous. There has been no change in the rate of production, but the outlook is such that a normal producing capacity at all plants will no doubt soon be warranted. Prices are generally believed to be stronger, and revised quotations are firm as follows, per net ton, f.o.b. cars here: 4 to 6 in., $21; 8 to 12 in., $20; over 12 in., average $19, with $1 per ton extra for gas pipe. These prices are probably subject to shading for large municipal contracts.

Old Material.—The tonnage handled in this market the past week was comparatively light, but prices were not affected. Considerably more interest has been manifested in steel grades than for some weeks, and a ready market is generally being found for accumulations of light cast and No. 1 machinery scrap. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$14.00 to $14.50
Old iron rails	12.50 to 13.00
Old steel axles	12.50 to 13.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.00 to 8.50
No. 2 country wrought	7.50 to 8.00
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.50 to 10.00
Tram car wheels	9.00 to 9.50
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, February 13, 1911.

The indications of increased interest in the iron market, covering both raw and finished material, are becoming more pronounced. Foundrymen and manufacturers of stoves, implements, wagons and railroad equipment are making inquiries for pig iron, bars, &c., covering in the aggregate a large tonnage. New specifications freely sent in by the railroads constitute a marked feature of the present situation. Bank clearings at St. Louis are 20 per cent. in excess of the same week last year; at Kansas City, 9 per cent. and St. Joseph 12 per cent., which are regarded as encouraging signs of a revival in general business.

Pig Iron.—The improvement noted in the inquiry for pig iron continued the past week in more pronounced form, and some sales of fair volume were booked. Quite a large tonnage, mostly Southern foundry, is still pending, part of which could easily be closed at a concession in the market price, but sellers are firmer in their views, and it is claimed that shading $11, Birmingham, is becoming less frequent. It is reported that one furnace company has advanced its price 50c. per ton and two others have withdrawn from the market. Inquiry for second and third quarter shipment is increasing, but no business has been done for that delivery. Among the inquiries reported are the following: Quincy, Ill., stove company, 3000 tons of Southern foundry for second and third quarters; a radiator company, 2500 tons of Northern and Southern, for the remainder of the first half. One of the leading brokers reports inquiries for various kinds of iron aggregating 15,000 tons, with sales of 5000 tons to various parties, mostly Southern foundry, principally for the remainder of the first half. Another leading broker mentions inquiries for around 8000 tons in the aggregate. In these reports there are duplications, since buyers apply to more than one office. The sale of 300 tons of gray forge is reported. We continue our quotation of $11, Birmingham, for Southern No. 2 foundry, for shipment over the remainder of the first half, with a premium of 25c. to 50c. asked for second quarter delivery. For spot shipment, doubtless a concession of 25c. per ton is still made.

Coke.—Inquiry for coke appears to be more active and the market is firmer. A merchant seller reports the sale of 15 cars of Connellsville foundry coke and an inquiry for 30 cars. A leading sales agency reports the sale of 1000 tons of foundry coke for shipment over the remainder of the year. For standard 72-hour Connellsville foundry, $2.10 to $2.40 per net ton is asked, f.o.b. oven. For carload lots and special brands the price is 25c. to 50c. higher.

Finished Iron and Steel.—The leading interest reports some inquiry for standard rails and for light rails there is a moderate call from coal interests. The inquiry for structural material has improved in a marked degree. For bars there is a good inquiry from both jobbers and manufacturers. Track material is in fair demand. An inquiry is out for 2000 kegs of spikes and the sale of 1,000,000 bolts has been made.

Old Material.—The leading dealers report a decided improvement in the outlook, with an increase in the inquiry from consumers. The market is hardening on prices. The inquiry for relaying rails is better. The following railroad lists are on the market: Vandalia Line (additional), 300 tons; Cotton Belt, 250 tons; Southern Railway, 600 tons. While there is no change in prices to report, the entire list is held more firmly at quotations. We quote dealers' prices, per gross ton, f.o.b. St. Louis:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	22.50 to 23.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.00 to 16.50
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.00 to 10.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.00 to 7.50

Matthew Addy & Co. have been appointed the exclusive sales agents of the Clare Coke Company of Greensburg, Pa., maker of high grade Connellsville foundry and furnace coke.

The International & Great Northern Railroad is in the market for a large tonnage of track fastenings.

The Missouri-Pacific Railroad is figuring on specifications for 75 locomotives, mostly for freight traffic.

The plant of the American Steel Foundries at Granite City, Ill., has been shut down. It is reported that the company, having slack business, availed itself of the opportunity to make some repairs. It is believed that operations will be resumed prior to March 1.

The Dallas Hotel Company, Dallas, Texas, has been incorporated. The capital stock is $600,000. The corporation will erect a 20-story structure, the ultimate cost of which will be about $1,250,000. On the directorate are the following St. Louis men: Adolphus Busch, E. A. Faust, W. H. Glancy, D. S. Clauss and August A. Busch.

San Francisco

SAN FRANCISCO, February 8, 1911.

A stronger feeling is becoming apparent. Small orders are more numerous, though large transactions are still the exception. There is no lack of important inquiries, some of which are now taking definite shape. The end of the rainy season is expected to bring out some of the business now pending. The local outlook in several departments has been greatly improved by assurance of the Panama-Pacific Exposition, which is bringing out a stronger inquiry for building materials. The general jobbing trade outside of San Francisco is fully normal for this season, with excellent prospects for the next few months. Merchants, however, remain very conservative about placing orders for stock, though the current demand compels them to buy more freely than for some time.

Bars.—The distributive market is still in an unsatisfactory condition, due principally to competition between local iron and foreign or Northern steel. While there is no change in open quotations, the tendency is toward further price cutting. Small inquiries for soft steel have increased considerably, and the actual movement is somewhat larger than

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last month, more interest being manifested by large consumers. Merchants are limiting their purchases as closely as possible, and regard foreign material with less favor than a year ago. The greatest improvement so far has been in reinforcing bars, representatives of Eastern mills having booked a very fair tonnage this month. Several large inquiries have come from outside points, and considerable activity in this city is anticipated. A heavy tonnage will be required later in the year for harbor improvements, both in the San Francisco Bay district and at other coast points. Bars from store, San Francisco, are quoted at 2c., with unconfirmed reports of sales at somewhat lower figures.

Structural Material.—The San Francisco record of building permits for January showed a valuation of $1,750,841, compared with $1,170,000 for the same month of 1910, and an increase of more than $200,000 over the December valuation. While the record shows an unusually large proportion of fireproof construction, most of the buildings now under way are small, requiring little or no fabricated steel. The Central Iron Works has taken a contract for the St. Ignatius College building on Fulton street, but aside from this nothing of any importance has been let locally. The American Bridge Company will fabricate the steel for the Northern Electric bridge at Sacramento, Cal. Notwithstanding the present dullness, the outlook is considered satisfactory. A number of old projects which may be let at any time will aggregate a considerable tonnage, and orders are likely to be hastened by the increasing firmness of the market. There are also many plans about ready for figuring, which have been withheld pending definite assurance of the Panama-Pacific Exposition. There is some talk of an addition to the Palace Hotel, and it is expected that several old hotel projects will be revived. The Van Nuys office building is the principal structure in prospect at Los Angeles. Bids on the Multnomah county court house at Portland, Ore., will be opened February 25, and bids will be received February 13 for several steel bridges in Oregon. The El Paso Iron & Bridge Company, El Paso, Texas, has taken a contract for a mill for the El Paso-Madera Lumber Company.

Rails.—Recent rail business, though composed of small scattering orders, has been of fair volume for this season. Some inquiries of more than usual importance have come up and conditions are favorable for continued activity through the spring. A new road is to be built in Nevada this year, to connect with the Southern Pacific at Bishop, Cal. There is not much movement in light rails at the moment, but a general demand is expected as soon as the weather becomes settled.

Sheets and Plates.—The distributive movement of black and galvanized sheets is now fairly active, and the consuming demand appears to be growing all over the State. Merchants have for some time been carrying light stocks, and are getting actively into the market for immediate needs. They are buying only in a small way, however, apparently in expectation of lower prices, notwithstanding assurances from producing centers that values will be maintained. The demand for plates is normal, but there is no particular feature in this department at present.

Merchant Pipe.—Local business has been dull for nearly a year, but is beginning to show a little more life, and merchants anticipate a fair activity within the next few months. The demand through the State is steadily increasing. Jobbing stocks are being kept down as closely as possible, but orders for immediate shipment from the mills are becoming more numerous. The situation in oil casing and line pipe is improving, but is not yet entirely satisfactory. Plans are being developed for some important pipe line projects, but little definite inquiry is coming up. The city of Spokane, Wash., is in the market for a lot of 10 and 14 in. kalamein pipe.

Cast Iron Pipe.—The local office of the United States Pipe Company booked orders for about 7000 tons last month. Business continues active, as there is a general impression that prices will be advanced from the present low level. Small orders continue to come in from water and gas companies all over the coast, in addition to considerable municipal business. H. M. Byllesby & Co., Chicago, have been in the market to some extent for improvements to their coast plants, and are expected to buy on quite a large scale during the year. The San Joaquin Light & Power Company is planning to replace the gas system at Merced, Cal. The town of Santa Barbara, Cal., has ordered a lot of pipe from the United States Pipe Company and fire hydrants from the Crane Company. The towns of Tullock and Monrovia, Cal., have just received bids, the latter for 450 tons. The town of Madera, Cal., has called for bids for a complete water system. Contracts will be let shortly for another lot of valves and gates for the San Francisco salt water system.

Pig Iron.—Some foreign iron is being sold to arrive, but the movement is slow, most local melters refusing to take any interest in the market. A cargo of 3500 tons arrived from China last week. Prices still show considerable range, depending on conditions of sale, but importers are a little firmer in their views, asking about $23 for spot foundry iron.

Old Material.—So far there has been little stir in the market, cast scrap being generally neglected, though offerings of desirable material are light. Several large transactions in steel melting scrap are pending, and may be closed at any time. Prices on all descriptions are firmly held, being as follows: Cast iron scrap, per net ton, $18; steel melting scrap, per gross ton, $12.50; wrought scrap, per net ton, $12 to $15; rerolling rails, per net ton, $15. Beard & Son, Portland, Ore., have chartered a barge to transport 2000 tons of steel scrap from Portland to Irondale, Wash.

Buffalo

BUFFALO, February 14, 1911.

Pig Iron.—Considerable new inquiry has come out the past week, largely for foundry grades, from New England, New Jersey and eastern Pennsylvania, aggregating about 20,000 tons. Orders totaling 10,000 to 12,000 tons, of foundry grades, with a small proportion of malleable, have been booked. In the matter of prices, conditions have reached a point where the local furnaces are not anxious for bookings at the unprofitably low prices which have prevailed recently, and have thought it unwise to continue them; in fact, a majority of Buffalo district furnaces withdrew a week ago from the low range quotations, and as a consequence there has been more or less stiffening in price schedules for the current week. In line with this, and with the information which is procurable, we have advanced our schedule 25c. per ton for practically all grades, as given below, for prompt and first half delivery, f.o.b. Buffalo, no quotations being made for last half:

No. 1 X foundry	$14.50 to $15.00
No. 2 X foundry	14.00 to 14.50
No. 2 plain	13.75 to 14.25
No. 3 foundry	13.75 to 14.00
Gray forge	13.50 to 14.00
Malleable	14.25 to 14.75
Basic	14.50 to 15.00
Charcoal	17.25 to 18.00

Finished Iron and Steel.—The outlook is better in most lines, and a number of mills and agencies report more orders coming in than for some weeks for miscellaneous short time requirements while some contracts for forward requirements are being placed. Specifications on existing contracts are also being released in fairly large volume. Underlying conditions are apparently becoming stronger as indicated by present inquiry and placement. In the Canadian export trade conditions are also very good and a large amount of business in general lines is being closed right along. In fabricated structural material plans for projected local construction to be undertaken this spring are not coming out for figures as rapidly as was anticipated a few weeks ago, but will probably be in readiness for bids within the next month. It is expected that bids for steel for the new office building of the Buffalo General Electric Company, involving a considerable tonnage, as it will include a 20-story tower of large dimensions, will be ready for figuring next week. Revised plans for the first building of the group to be erected by the Buffalo Orphan Asylum are being bid upon this week, taking about 100 tons of steel, and bids are also being received for a highway bridge over the Erie Canal, west of Syracuse, about 100 tons. The Cambria Steel Company has been awarded contract for the structural steel, 1000 tons, required for the power house to be built by the State at Albany.

Old Material.—The demand for scrap material in most grades continues to improve and shipments are still moving forward freely on contracts. There has been quite active inquiry for car wheels and for cast scrap as well as for heavy melting steel, and prices have advanced. Malleable scrap has also been affected, in sympathy with the rise in these lines and other commodities, most of which have shown an upward move of 25c. to 50c. per ton. There has also been a little inquiry from outside districts for borings and turnings. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.25 to $13.75
Low phosphorus steel	17.50 to 18.00
No. 1 railroad wrought	15.25 to 15.50
No. 1 railroad and machinery cast scrap	14.25 to 14.50
Old steel axles	20.00 to 21.00
Old iron axles	23.50 to 24.50
Old car wheels	14.50 to 15.00
Railroad malleable	13.75 to 14.00
Boiler plate	11.25 to 11.75
Locomotive grate bars	11.25 to 11.75
Pipe	10.75 to 11.25
Wrought iron and soft steel turnings	7.25 to 7.75
Clean cast borings	6.75 to 7.00

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New York

NEW YORK, February 15, 1911.

Pig Iron.—New England has continued to be the center of interest for local sellers of pig iron in the past week. The low prices named in that district by a number of producers, particularly Buffalo furnaces, resulted in a moderate amount of buying that is known, and there are indications that both there and in the New York district a number of transactions have been quietly put through on a low basis. There is a feeling among some sellers that the competition for recent business has been overdone and that enough business has been booked to permit of a stand for a slightly better price. A number of furnaces are now asking 25c. to 50c. advance upon the prices named in the recent scramble. While the level on which sales have been made has been most discouraging to furnace interests, there are indications that both producers and important consumers recognize the probability of the turning point being reached by just such developments as those of the past week or two. We quote for tidewater delivery as follows: Northern No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $14.75; Southern No. 1 foundry, $15.50 to $15.75; No. 2, $15 to $15.25.

Steel Rails.—The rail manufacturers have closed few contracts this month, though a number of roads are negotiating. The Chicago City Railways have bought 15,000 tons of girder rails, 10,000 tons going to the Steel Corporation, to be rolled at Lorain, Ohio, and 5000 tons to the Pennsylvania Steel Company, to be rolled at Steelton, Pa. Several New England street railroad companies are in the market for girder rails, the total being about 3700 tons.

Ferroalloys.—The Carnegie Steel Company has placed an order with a New York firm for 5000 tons of ferrosilicon. The price in this market is between $54.50 and $55, Pittsburgh. There are a few inquiries for small lots of ferromanganese and the usual quotation is from $37.50 to $38, Baltimore.

Finished Iron and Steel.—The last two weeks have been a little disappointing, for orders have been slower coming in than was expected from the improvement evident during the last of January, but it is believed that the falling off is only temporary and that recent conditions will be restored before the end of the month. Plates are quiet, but in small lots a fair business is being done. Steel bars are about holding their own; good specifications are being received on old contracts, but new demand is light. Bar iron orders have been considerably better; buyers apparently concede that the price can hardly go lower, consequently orders are coming in more freely, while some of the lowest sellers have withdrawn outstanding quotations, feeling confident of being able to get higher prices. Structural material particularly feels the falling off, but several good prospects are in the New York market and are expected to be closed within a week. These include 400 tons for the New York, Ontario & Western shops, at Middletown, N. Y., bids on which closed February 9; 4000 tons for the Delaware & Hudson shops; 1000 tons for the Fischell Building in this city, and 700 tons for a loft building at 416 to 422 West Thirty-third street, also in this city. Contracts closed include 2500 tons for catenary electric line construction for the New York, New Haven & Hartford, awarded by the general contractor, S. W. Bowles Company, to the Eastern Steel Company, the Cambria Steel Company and the Riverside Iron Works; 3500 tons for the Cruikshank warehouse, New York, taken by the Hilkle Iron Works, which will furnish the cast iron material and have about 2000 tons of structural material to place; 1500 tons for the Kline & Jackson warehouse, at Seventh avenue and Twenty-third street, New York, taken by the Hay Foundry & Iron Works; 600 tons for a warehouse for the Union Bag Company, at Sandy Hill, N. Y., taken by the American Bridge Company; 600 tons for a warehouse for the Graselli Chemical Company, Newark, N. J., and 180 tons in three bridges for the Boston & Maine, taken by the Phoenix Bridge Company. Among the definite prospects still pending are the post-office at the Pennsylvania terminal, the Woolworth Building and the Masonic Temple addition on West Twenty-third street, New York. Plans are now being prepared for a building for the New York Telephone Company, which will probably be 14 stories, with provision for later adding 10 more, and which it is estimated may require between 10,000 and 15,000 tons. Prices are firm, as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.35c. to 1.40c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Cast Iron Pipe.—The largest transaction reported in this vicinity the past week was the purchase of about 14,000 tons of pipe by the Brooklyn Union Gas Company. The greater part was secured by the Warren Foundry & Machine Company, 8000 tons of 30 to 42 in., and the remainder, comprising sizes running from 4 to 24 in., was divided between M. J. Drummond & Co. and John Fox, Jr. The water pipe for Worcester, Mass., about 2100 tons, on which bids were opened February 7, was secured by the United States Cast Iron Pipe & Foundry Company. The contract for water pipe for Fall River, Mass., 470 tons, on which bids were opened February 8, went to R. D. Wood & Co. No public lettings of importance are announced for this immediate vicinity. The private water and gas companies are still actively in the market. Competition is keen on the business coming up, it being evident that some pipe foundries are exceedingly anxious to fill their order books. Quotations are continued at $21.50 to $22 per net ton, tidewater, for carload lots of 6-in.

Old Material.—A decided increase is perceptible in inquiries, and dealers are expecting a much larger volume of business in the near future. More interest is taken in heavy melting steel scrap; while some demand is coming from consumers, the bulk of the buying so far has been among the dealers, some of whom have contracts which they feel obliged to cover. While thus far the improved feeling here may be regarded as more or less sympathetic with the better conditions reported at Pittsburgh, it must be admitted that the whole situation shows marked betterment. Quotations, per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$10.75 to $11.25
Heavy melting steel scrap	10.75 to 11.25
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.50
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.50 to 6.00
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	10.50 to 11.00
Old car wheels	12.50 to 12.75
No. 1 heavy cast, broken up	12.50 to 12.75
Stove plate	9.75 to 10.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.50 to 13.00

The Fechheimer Steel & Iron Company, dealer in old material, 231 North Front street, Allentown, Pa., emphatically denies the rumor in circulation that it is in some way connected with another corporation in the same line of business. The company states that it is not only not connected with any other corporation but that no other corporation holds any of its stock.

Metal Market

NEW YORK, February 15, 1911.

THE WEEK'S PRICES

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
Feb.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
9	12.75	12.37½	38.20	4.45	4.30	5.50	5.30
10	12.75	12.37½	40.00	4.45	4.30	5.57½	5.42½
11	12.75	12.37½	....	4.45	4.30	5.57½	5.42½
14	12.75	12.37½	{45.00 / 45.25}	4.45	4.30	5.57½	5.42½
15	12.75	12.37½	45.75	4.45	4.30	5.57½	5.42½

Tin is bringing much more in New York than the cost of importation. Copper held steady during the week and a few buyers came into the market. Lead is weak. Spelter is quiet but firm.

Copper.—The Copper Producers' statistics had but little effect on the market. A fair amount of steady buying has been done during the week, and consumers have shown no disposition to ask for reduced prices. A large part of the business done has come from the Waterbury district. The market is fairly firm at 12.75c. for lake and 12.37½c. for electrolytic. At the close of trading in London to-day spot copper was sold for £54 17s. 6d. and futures for £55 11s. 3d. The sales amounted to 200 tons of spot and 300 tons of futures. The market closed strong.

Pig Tin.—Pig tin is bringing more than the cost of importation in this market, which is largely due to the fact that stocks here are very small. The London syndicate, which has controlled the situation for several months, began to liquidate last Thursday, but later bought freely, according to cables sent to metal trading companies in this country from their European connections. The selling on Thursday was caused by internal troubles in the syndicate. The market in London has been picking up since Thursday, and it is believed there that some of the moving spirits in the syndicate are taking hold again. The New York market is moving independently of the English fluctuations, as what little stock there is in this country is closely concentrated. Buyers are taking the metal only as they need it and are purchasing very sparingly, but at that the amount of business done indicates that consumers are very short of stocks. The London market closed to-day with spot tin selling at

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£197 and futures at £193. The sales amounted to 200 tons of spot and 800 tons of futures. The market closed steady. In New York this afternoon pig tin sold at 45.75c., while the cost of importation is placed at 43.15c.

Tin Plates.—Consumers of tin plates are buying freely and more business is being done now than at any time within the last three months. Some of the independent mills are charging a little more than the leading interest, and much of the buying done during the last week, it is thought, has been influenced by the belief that prices may advance further. The bottom price for 100-lb. coke plates in New York is $3.94.

Lead.—Lead is weak. It is freely offered in St. Louis at 4.30c., which makes the price in New York 4.45c. As far as selling is concerned, the leading interest is practically out of the market in this city, as it is maintaining its quotations at 4.50c. The demand is very light and the outside dealers seem anxious to procure business.

Spelter.—Spelter is firm and inquiries indicate that a good buying movement is in sight. Consumers have been holding off so long that it is the general belief that many of them are short of stock. There is very little spot spelter in New York and buyers are placing orders for prompt shipment from East St. Louis.

Antimony.—Stocks of antimony are very plentiful, and the market is weak. Hallett's is offered at 7.75c.; Cookson's at 8.25c., and other brands from 7.25c. to 7.50c.

Old Metals.—The demand from consumers is improving. Dealers' lowest selling prices are as follows:

	Cents.
Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.75 to 11.00
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.25 to 4.30

Metals, Chicago, February 14.—Large consumers of copper have been steady buyers recently, with no change in prices for Chicago delivery. Tin has recovered this week from its sensational drop last week and is quoted higher. Spelter is a little stronger, with increased demand. We quote Chicago prices as follows: Casting copper, 12⅝c.; lake, 12¾c. to 12⅞c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 45c.; small lots, 47c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 4.45c. to 4.50c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¼c.; copper bottoms, 10c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9c.; lead pipe, 4⅝c.; zinc, 4¼c.; pewter No. 1, 29c.; tin foil, 34c.; block tin pipe, 37c.

Metals, St. Louis, February 13.—Lead is weak at 4.30c. to 4.32½c.; spelter is stronger at 5.35c., both at East St. Louis. Zinc ore is held at $40 and $41 per ton, Joplin base. Tin is easier at 40.35c.; antimony (Cookson's) unchanged at 8.60c.; lake copper is quoted at 13.05c.; electrolytic at 12.70c., all at St. Louis. The demand for finished metals for the past week ruled fair, not brisk.

The German Iron Market

BERLIN, February 2, 1911.

The leading newspaper of Essen several days ago printed its usual monthly review of the market, which was again characterized by undue pessimism. A few of its first sentences are as follows: "The market persists in an apathetic quiet. Activity in placing orders has been suspended for months, the wholesale trade being uncertain regarding future developments, and therefore avoiding new engagements. Nevertheless, the amount of business in hand with the works has kept up tolerably well. Here and there, indeed, there is a perceptible lack of work, and it will soon be a necessity to secure new orders. Up to now, however, there are no signs that they will be forthcoming, although we have reached the time of year when the spring trade should set in."

This report is regarded as much too dismal. It is a significant fact that the stock market paid no great attention to it. Within a day or two it was dismissed, and now iron shares are again rising in sympathy with the better tendency indicated in this week's *Iron Age* as having shown itself in the American market.

It must be admitted, however, that German export prices have been cut pretty low, and there is as yet no indication of a general improvement in the near future. Competition with Belgian works remains very sharp, and prices in Belgium are again lower. A Brussels dispatch of to-day says that the downward price tendency of pig iron has grown more pronounced. Another dispatch of this week from Brussels states that prices of bars for export are also lower in consequence of German and English competition; that bars of basic steel, f.o.b. at Antwerp, have dropped to 92 to 94.50 shillings, and iron bars to 95 to 96 shillings. On the other hand, a letter in one of the Berlin stock exchange papers this week from its Belgian correspondent says that basic steel bars had fallen as low as 91 shillings, but that they had rapidly recovered to 93 and 94 shillings.

A review of the Silesian market indicates that considerable activity in heavy plates has manifested itself this month. Better business is coming in from home consumers, and the mills are giving correspondingly less attention to the foreign market.

Iron and Industrial Stocks

NEW YORK, February 15, 1911.

While transactions have been on only a moderate scale, prices have been well maintained. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com	8¼	Railway Spr., com.	37 - 37⅝
Allis-Chalm., pref.	32 - 33⅛	Railway Spr., pref.	98½ - 99½
Beth. Steel, com	32¼ - 33⅝	Republic, com	34½ - 35½
Beth. Steel, pref	62 - 64	Republic, pref	98½ - 99¼
Can, com	9½ - 10	South. I. & S., pref	11¼
Can, pref.	80⅝ - 82⅜	Sloss, com	55¼ - 56¼
Car & Fdry, com	56½ - 57½	Sloss, pref	112
Car & Fdry, pref	118 - 118⅞	Pipe, com	18
Steel Foundries	48 - 52½	Pipe, pref	55 - 56¾
Colorado Fuel	35¼ - 36	U. S. Steel, com	80¼ - 81⅛
General Electric	154½ - 155½	U. S. Steel, pref	119 - 119½
Gr. N. ore cert	62½ - 63½	Westinghouse Elec.	69½ - 70½
Int. Harv., com	114¼ - 119¾	Va. I., C. & C.	64 - 65
Int. Harv., pref.	122½ - 122¾*	Am. Ship, com	76 - 78*
Int. Pump, com	43 - 44	Chi. Pneu. Tool	48⅛ - 49¾
Int. Pump, pref	86¾ - 89	Cambria Steel	45½ - 45⅝
Locomotive, com	41⅝ - 42¾	Lake Sup. Corp	30½ - 30⅞
Locomotive, pref	110	Pa. Steel, pref	106½
Nat. En. & St., com	17⅝	Warwick	10¾
Pittsburgh St., pref.	101¼	Crucible St., com.	13 - 13½
Pressed St., com	35½ - 36	Crucible St., pref.	80 - 80½
Pressed St., pref.	98 - 98⅞	Harb.-W. Ref., com.	40 - 41

* Ex dividend.

Dividends.—The Niles-Bement-Pond Company has declared the regular quarterly 1½ per cent. dividend on the preferred stock, payable March 15, and 1½ per cent. on the common, payable March 20.

The Ashton Valve Company has declared the usual quarterly dividend of 1½ per cent., payable February 15.

The General Electric Company has declared the regular quarterly dividend of 2 per cent., payable April 15.

The Republic Iron & Steel Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

The United States Cast Iron Pipe & Foundry Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable March 1.

Notes on Prices

Rope.—Manufacturers of cordage feel somewhat encouraged in regard to the future, owing to the business being received by them, the volume of which is rather in advance of that expected at this season. It is stated that the sale of "commercial sisal" rope, which is about equivalent to third grade, is largely in excess of the other grades. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for small sizes: Pure Manila of the highest grade, 8¾c. to 9¼c. per pound; second grade Manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; rove jute rope, ¼-in. and up, No. 1, 6¼c. to 7c. per pound; No. 2, 6c. to 6½c. per pound.

Linseed Oil.—The Eastern market is very dull, but prices have been advanced 1c. per gallon on account of the latest quotations from London and Liverpool, where prices are equivalent to $1 per gallon laid down in New York, duty paid. The strong foreign market is due to the fact that enough Argentine oil is being received to fill contract orders. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
State, raw	93
City, raw	93

Oil in lots of less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon over raw.

Rosins have also advanced in sympathy with higher prices at Southern points, with a fair demand. On the basis of 280 lb. to the barrel, common to good strained is quoted at $7.25 and grade D at $7.40 in the New York market.

The New Minnesota Ore Road

Large Bonuses on Steel Corporation Stock—Ore for Algoma Works

MARQUETTE, MICH., February 11, 1911.—The Canadian Northern Railroad, which is extending its lines to the head of Lake Superior from the Mesaba iron range, and which expects eventually to handle a considerable ore traffic, has started the construction of a merchandise, ore and coal dock at West Duluth. It will have an approach of nearly 1500 ft. and will extend about 2000 ft. into the bay. One-half of the structure will be completed this year, and with the opening of the shipping season in 1912 the entire dock will be in commission. Several warehouses will be built.

The Duluth, Missabe & Northern and the Duluth & Iron Range Railroad, Steel Corporation subsidiaries, which haul the bulk of the ore from the Mesaba and Vermilion ranges, will pay to the State of Minnesota a combined tax of $829,607 on their gross earnings for the year 1910. The Missabe earned $12,588,086 and the Iron Range $8,152,105. The tax on the former is $503,523 and on the latter $326,084, which compare with $495,866 and $346,231, respectively, the preceding year.

Representatives of the Lake Superior Corporation, which controls the Algoma steel plant and blast furnaces at Sault Ste. Marie, Ont., have been arranging for the purchase of ore for 1911 delivery. The company uses about 1,000,000 tons of ore a year, of which about half is procured in this country and the balance at the company's own properties in the Michipicoten district. A small part of the American ore comes from the Millie Mine, at Iron Mountain, Mich., the lease of which is controlled by the Lake Superior Corporation.

The employees of the Oliver Iron Mining Company who subscribed for the 1906 issue of the preferred stock of the United States Steel Corporation, and who still hold their shares, have received notice of the payment of a special bonus of $21.35. This is in addition to the regular bonus of $5 and the dividend of $7 a year. The total returned to date to subscribers to the 1906 stock in extra bonus, yearly bonus and dividends is $81.35. It is needless to say that the holders are immensely pleased with their investment. The extra bonus is next to the largest paid by the corporation. The largest was on the issue of 1903, which totaled $65.04. That issue was sold to employees at the rate of $82.50 per share. The return on this investment has been, in addition to the $65.04 extra bonus, $25 in yearly bonus and $56 in dividends, a total of $146.04, which, added to the present market value of the stock, gives an aggregate of nearly $265. The extra bonus money comes from the accumulation of bonuses and dividends on stock subscribed by employees who have dropped out the past five years.

A statement has been published that the United States Steel Corporation was building a power plant on the Menominee River, 4 miles from Iron Mountain, at a cost of $750,000, to furnish power to the mines as well as to the city. It is without foundation. The water power referred to is owned by interests other than the Steel Corporation and will be put to commercial use by private capital. The Steel Corporation already owns a hydraulic plant at Quinnessec Falls, on the Menominee River, which is supplying compressed air to the Chapin mine. A water power project is being seriously discussed by the White Iron Lake Iron Company, which proposes the erection of a plant at the falls of White Iron Lake, on the Vermilion range, in Minnesota. The company owns 120 acres of land adjoining the famous section 30 property on the south. The falls are the outlet of White Iron Lake and have a hight of 12 ft. It is proposed to construct a dam 12 ft. high. The company would furnish power to the mines at Tower and Ely and vicinity and to other Vermilion range industries. The White Iron Lake Iron Company has holdings on both the Vermilion and Mesaba ranges.

The International Harvester Company is again searching for iron ore in the Crystal Falls district of the Menominee range. It has resumed exploratory operations at the lot 3 property. Ore of excellent grade was encountered previously, but with high manganese content. The present work is in a portion not heretofore explored. Lot 3 is in the Paint River valley and as far as location goes it bears the earmarks of a promising mine.

The strike recently made at the Aronson property in the Iron River district of the Menominee range is apparently one of importance. The diamond drill is said to have passed through 150 ft. of merchantable ore, with indications that the deposit is large. The property is in the hands of the Geary & Powers Exploring Company of Hibbing, Minn., and will probably be turned over to one of the large operating companies.

Ore from Rogers, Brown & Co.'s Ohio mine at Michigamme, Marquette range, is being shipped to Iron Mountain, Mich., for treatment in the Ardis furnace of John T. Jones.

Obituary

ROBERT PEEBLES, vice-president of the Ashland Iron & Mining Company, Ashland, Ky., died recently at Los Angeles, Cal., aged 65 years. He had been connected with the iron trade for many years.

CHARLES R. RHODES, general manager of the Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, died February 9, aged 44 years. He was a nephew of the late Joshua Rhodes, was born in New Castle, Pa., and was educated in the public schools there. He went to Pittsburgh about 25 years ago and entered the employ of the Shook-Anderson Mfg. Company, which later was absorbed by the Pittsburgh Valve, Foundry & Construction Company. For more than 10 years Mr. Rhodes was manager. He was also director of the National Car Wheel Company and the Pennsylvania Casting & Machine Company. He leaves a widow and four children.

The Henry Souther Engineering Company's Laboratory

The Henry Souther Engineering Company has purchased a plot of land, 100 x 150 ft., at the corner of Laurel and Willow streets, adjoining the Columbia Motor Car Company on the north, in Hartford, Conn. On this plot it has begun the erection of a brick building, 35 x 60 ft., to be arranged for a chemical and metallurgical laboratory. A complete physical testing laboratory will also be installed, including White-Souther alternate stress machines and a most modern tensile testing machine designed by Tinius Olsen & Co., Philadelphia. The Olsen machine has a capacity of 100,000 lb. and can be used for tensile, transverse and compression tests.

The company expects to move from its present quarters at 440 Capitol avenue, Hartford, and locate in its new laboratory building during April. The officers of the company are: Henry Souther, president; C. S. Dunbar, secretary, and F. P. Gilligan, treasurer.

The Dodge Quarter Century Club.—On January 28 the Dodge Mfg. Company, Mishawaka, Ind., organized a Quarter Century Club. Only those officers and employees who have been in the service of the company 25 years or more are eligible for membership. This organization is the outcome of a special feature of the industrial parade in that city on the Fourth of July, 1908, when automobiles containing 24 officers and employees of the company who had been in its service for that period or longer constituted one of the sections. Since that time two of the old employees have died, and three more have become eligible, so that the club starts with 25 charter members. The president, M. W. Mix, president of the company, celebrated the twenty-fifth anniversary of his connection with it on January 26.

Solid steel Detroit-Fenestra windows will be exhibited at the Chicago Cement Show in space 277, February 17 to 23 by the Detroit Steel Products Company, Detroit, Mich.

Customs Decisions

Sewing Machines

The incorporation in the Tariff act of 1909, for the first time, of a special provision for sewing machines has resulted in a test case being brought before the Board of United States General Appraisers for the purpose of construing it. Paragraph 197 enumerates sewing machines with several other kinds of machines, all dutiable at 30 per cent. Under the Dingley Tariff act of 1897, sewing machines were not provided for by name, and were held to fall within the meaning of paragraph 193 of that act as "manufactures wholly or in part of metal, or of which metal is the component material of chief value," dutiable at 45 per cent.

When Congress had the present tariff under consideration, pressure was brought to bear to have the duty on sewing machines reduced from 45 to 30 per cent., and a special provision inserted for such machines. This was done, the general understanding at the time being that the term used referred to the usual domestic apparatus. Now, however, Durburrow & Hearn, importers, make the point before the board that other kinds of sewing machines are entitled to classification under paragraph 197 at the reduced rate of duty.

Specifically the importers in the present test case claim that machines made by the Singer Sewing Machine Company and used for sewing leather, to make what is known as the prix seam, fall properly within the scope of the sewing machine paragraph of the new law. One of the allegations made is that the machines are for sewing straw hats. The Government intends to make a strong fight to have paragraph 197 construed in such a manner as to restrict its scope to the sewing machines used in the home for domestic purposes, its representatives contending that, in reducing the duty from 45 to 30 per cent., the object sought was to benefit housewives. It was not the intent of Congress, the Government hopes to show the board, to admit all kinds of sewing machines at the lower rate, but that machines used for general manufacturing purposes are intended to pay 45 per cent. It is likely that at the hearing to be held February 17 the Government will not lack for witnesses in support of its proposition.

Erasers with Fixed Blades

The Board of United States General Appraisers, in construing the tariff act of 1909, relating to erasers which have fixed metal blades set into handles of wood or other material, upholds a high rate of duty imposed by the customs authorities. The first test case of the kind to come before the board stands in the name of J. D. Irwin & Co., New York. Duty, to which the importers make objection, was levied at the rate of 40 per cent. advalorem and 10 or 20 cents each, according to value. The protest sets up various claims at lower rates under paragraphs 154 and 199. General Appraiser Fischer says in his decision for the board, that the articles are erasers of the kind denominatively provided for in paragraph 152.

Steel Railroad Ties

The Board of United States General Appraisers has taken unfavorable action on protests filed by Joseph Blank, New York, regarding the classification of steel railroad ties. They were assessed with duty at the rate of 45 per cent. as manufactures of metal, under paragraph 199, tariff act of 1909, and were claimed dutiable at a rate proportioned to the value, under paragraph 131, as "steel not specially provided for." In a case arising under the Dingley act of 1897, the board held that bars of sleeper steel in length about 25 ft. were, in fact, within the class of crude or simpler forms of rolling mill products, and dutiable under the provision for "steel in all forms and shapes, not specially provided for," under paragraph 135. The shorter lengths were held not to be manufactured products and to be likewise dutiable under paragraph 135. Subsequent to this ruling the provision in paragraph 135 in question was construed by the courts to apply only to uncompleted forms and shapes of steel, such as were in the nature of steel material to be still further manipulated and worked up into finished articles. In denying the contention of the importer for a lower rate on the merchandise General Appraiser Fischer has this to say:

> The analogous provision in paragraph 131, tariff act of 1909, reads, "steel not specially provided for," and the change so made in the wording of the provision indicates beyond doubt that Congress had in mind by this catch-all clause only unfinished forms of steel as "material." This view would exclude therefrom finished steel railroad ties, ready for special use, and such articles would find classification under paragraph 199, as herein assessed. The line so drawn between the steel as "material" and the article made therefrom requires no extended comment. The collector's assessments are affirmed and the protests overruled.

The Yuba Construction Company

The Yuba Construction Company, Marysville, Cal., the largest gold dredge designer and builder in the West, has entered into an agreement with the Bucyrus Company, South Milwaukee, Wis., by which it takes over the exclusive agency for Bucyrus gold dredge machinery for Alaska and British Columbia. This arrangement enables the Yuba Company to give special attention to the Alaskan dredging business and, as a further facility for handling that business, it has opened an office in Seattle, in the Alaska Building, which will be maintained permanently, in addition to the San Francisco office. P. R. Parker, formerly engineer with the San Francisco office of the Bucyrus Company, is now in charge of the Seattle office of the Yuba Company.

The Yuba Construction Company also recently acquired the business and equipment of the Western Engineering & Construction Company, San Francisco. The latter is one of the oldest firms engaged in gold dredge construction. With these two important acquisitions, the company is in an especially good position for handling gold dredge construction for any requirements. It is now building three 15-cu. ft. dredges in California, a 13½-cu. ft. and a 9-cu. ft. dredge in Idaho, and is installing a complete hydroelectric plant and an 8½-cu. ft. dredge with steel hull in Columbia, South America.

The Farrell, Kemp & Gushe Company.—Farrell, Kemp & Gushe, Joliet, Ill., a copartnership, has been incorporated with $12,000 capital stock under the title of the Farrell, Kemp & Gushe Company. It is at present located at 516-18 Clinton street and does a general business in sheet metal, slate and tile roofing, furnace heating, &c., but will in the near future move into a new factory, 50 x 150 ft., now under construction. The company's present shop is equipped with a six-ton 50-in. stake riveter and punch, medium punch press, heavy rolls, heavy slitting shear, and an 8-ft. heavy brake, besides the necessary apparatus for light sheet metal work. This equipment will be moved into the new factory when completed, in addition to which there will also be installed a toggle press, heavy rotary shear, spinning lathe, air riveters, &c., making it a strictly modern plant. C. S. Farrell is president; H. C. Gushe, vice-president; W. B. Kemp, secretary and treasurer.

The Electric Smelting of Swedish Iron Ore.—Full operations have been carried on for more than two months at the demonstration plant erected at Trollhätten Waterfalls in Sweden for the electric smelting of iron ore. The process is that of the Electrometal Company, which was employed at the Domnarfvet Works in the experiments of which reports have been published. Up to the latter part of January 670 tons of pig iron had been made, about 5 tons being obtained from each charge. A saving in coal of 67 per cent. from the fuel expenditure involved in ordinary blast furnace practice had been claimed, and this is being practically realized, it is said. In quality the product is up to expectations, particularly in the elimination of sulphur and phosphorus.

Half the product of Ivanhoe Furnace, at Ivanhoe, Va., in January had a phosphorus content under 0.035 per cent.

Iron Ore List with Lake Superior Map.—Oglebay, Norton & Co., Cleveland, Ohio, have issued an attractive booklet listing the Lake Superior ores they will sell in 1911, with analysis of each. The list shows few changes from that of 1910. A new ore appears in Bray No. 2, a coarse red hematite from the Bray mine on the Mesaba range. It is lower in moisture than the Bray ore, a trifle lower in iron and somewhat higher in silica and manganese. Woolsey, Yale and Porter ores, all from the Yale mine, do not appear in this year's list, the mine having passed into the hands of a consuming interest. A valuable feature of the booklet is the insertion of a colored map of the Lake Superior district, 15 x 27 in., which gives the locations of important mines. The Atikokan and Michipicoten ranges in Ontario are located and a smaller map on the same sheet shows the Moose Mountain range in the Georgian Bay district. A number of extra copies of this map, unfolded and on heavier paper, have been prepared, and the company will distribute these among its blast furnace friends desiring such copies for framing.

What Union Labor Is Doing for San Francisco.—In William L. Gerstle's annual address as president of the San Francisco Chamber of Commerce, he says: "Everything is on a competitive basic excepting labor, and this is due to the fact that we have not had the courage in San Francisco to enforce the open shop principle which prevails in our competitive cities. Since our fire in 1906, our manufactures have decreased year by year, and to-day we have but 30 per cent. of what we had four years ago. We have the harbor, the climate, transportation facilities, capital and cheap fuel—in fact, everything requisite for a manufacturing city; but as against this the cost of manufacturing is so high that we cannot compete with neighboring communities. So long as we suffer from this handicap we cannot hope to be a great manufacturing city, and without manufactures we are merely jobbers handling the products manufactured elsewhere on a small commission basis."

The Westinghouse Electric & Mfg. Company has received a contract from the Perine Machinery Company, Seattle, Wash., for four alternating current induction type CCL motors to be used in operating exhauster fans for removing chips, shavings, sawdust, &c., from the joiner and boat shops at the Puget Sound Navy Yard, Bremerton, Wash. The fan rotors will be overhung on the motor bearings; this direct connection of the units is probably the most interesting feature of the work. The four motors will have capacities of 10, 15, 50 and 75 hp. each. The work in connection with the installation of the motor driven fans will be done under the cognizance of the Bureau of Construction and Repair, Navy Department.

The Sharon Steel Hoop Company held its annual meeting at Sharon, Pa., last week. The following directors were elected: S. P. Ker, F. C. Perkins, Charles Bachman, G. W. Short, W. G. Kranz, J. P. Whitla and J. Reid Evans. The directors organized by electing S. P. Ker president; G. W. Short, vice-president; Charles Bachman, treasurer, and J. Reid Evans, secretary. No improvements to the plant were authorized or discussed. The improvements authorized last year, covering the construction of a 14-in. band mill, are well under way, and it is expected that the new mill will be in operation about June. The company had a fairly satisfactory year during 1910, but is operating to only about 50 per cent. of its steel capacity at present.

The Foundrymen's Club, a new Cincinnati organization, gave a beefsteak dinner at Wiedemann's, in Newport, Ky., the evening of February 9. About 50 members and their friends attended, and among the instructive addresses of the evening was one by Prof. John J. Porter of the Cincinnati University, whose subject was "Cupola Practice." The object of the Foundrymen's Club is to promote closer personal relations between local foundrymen, and in this it has the hearty support of the Associated Foundries organization.

In regard to the recently reported merger of the Reeves Mfg. Company and the Dover Forge & Iron Company, Canal Dover, Ohio, the former company advises us that it has purchased the plant of the latter and has increased its capital stock to $500,000. The Reeves Mfg. Company will add two sheet mills and a galvanizing department to its plant and will also make extensive additions and improvements to its roofing department.

The Duquesne Steel Foundry, Kendal Station, Pa., has for several years been using oil fuel in two of its open hearth furnaces, with equipment installed by Tate, Jones & Co., Inc., Pittsburgh. It is now abandoning natural gas and using oil exclusively and has let the contract to Tate, Jones & Co. for the equipment of its last and third furnace with the well-known Kirkwood system.

The Carris Mfg. Company, Washington, Iowa, manufacturer of screw machine products, has been absorbed by the Globe Mfg. Company, Perry, Iowa, and its factory has been moved to the latter place. The Globe Mfg. Company, it is understood, will be prepared to furnish estimates on screw machine products in about four weeks.

The McClintic-Marshall Construction Company, manufacturer and erector of steel buildings and bridges, has opened an office in the Morris Building, Philadelphia, in charge of C. H. Chubbuck, contracting engineer. This company also has contracting offices at New York, Pittsburgh, St. Louis, Chicago, San Francisco and Columbus, Ohio.

The Youngstown Steel Company, operating Tod Furnace at Youngstown, Ohio, held its annual meeting last week. E. L. Ford, Paul Jones, John Stambaugh, Henry H. Stambaugh and David Tod were re-elected directors. E. L. Ford was elected president and general manager; Paul Jones, vice-president, and John Stambaugh, secretary and treasurer.

The Warren Foundry & Machine Company held its annual meeting at Phillipsburg, N. J., February 13. The old Board of Directors was re-elected and in turn re-elected the present officers, as follows: William Runkle, president and treasurer; William H. Hulick, vice-president and assistant treasurer.

The Prentice Bros. Company, Worcester, Mass., builder of lathes and drilling machines, has given to Joseph T. Ryerson & Son, Chicago, the agency for its line in the territory west of Pittsburgh. The Fairbanks Company continues to represent the Prentice Bros. Company in Pittsburgh and the country east of that center.

The Westcott Chuck Company, Oneida, N. Y., manufacturer of lathe and drill chucks, has been notified that it has received the gold medal at the late Brussels Universal Exposition.

The Asbestos Protected Metal Company, Canton, Mass., has opened a branch office at 613 Fisher Building, Chicago, Ill., which is under the management of Wilmot W. Burritt.

The Pittsburgh Nail & Supply Company, Fuller Building, New York City, has opened offices in Room 2130 Oliver Building, Pittsburgh, with H. C. Cramer in charge.

The Lake Superior Iron & Chemical Company has made a reduction of 10 per cent. in wages at its charcoal furnace plant at Ashland, Wis.

The American Sheet & Tin Plate Company's plant, at Elwood, Ind., is operating 24 of the 28 hot mills.

Personal

George Q. Palmer, formerly vice-president, has been made president of the Alberger Condenser Company and the Alberger Pump Company, New York. Mr. Palmer is succeeded as vice-president in the Alberger Condenser Company by D. H. Chester, and in the Alberger Pump Company by W. S. Doran.

At the annual meeting of the Niles-Bement-Pond Company, C. L. Cornell was elected a director, succeeding Alexander Gordon, deceased. Other directors were re-elected.

Philip Frankel has resigned as secretary of the Cleveland Employers' Association, retaining the secretaryship of the Cleveland branch of the National Metal Trades Association. E. J. Hobday has been appointed secretary of the former association. The two associations will hereafter maintain separate offices, the Cleveland Employers' Association having established headquarters at 607 and 608 The Arcade.

William F. Wendt, Buffalo, N. Y., has been created grand commander of the Civil Order of Agricultural Merit by King Alphonso XIII. of Spain. Mr. Wendt is president of the Buffalo Forge Company, George L. Squier Mfg. Company, and Buffalo Steam Pump Company, besides being interested in other large manufacturing enterprises. He is also owner of one of the largest and best equipped fruit and poultry farms in the State of New York which exemplifies his interest in agriculture, and is publisher of the illustrated monthly periodical, *La Hacienda*, which was founded six years ago, is printed entirely in Spanish and Portuguese, and is to-day one of Buffalo's most successful enterprises. The royal decree establishing the Civil Order of Agricultural Merit states that its object is to reward eminent services rendered to agriculture in any of its branches. Membership in it is highly prized and eagerly sought in Spain. Grant to a citizen of the United States is believed to be without precedent.

M. D. Bixby has taken up his duties as direct representative of the Colonial Steel Company in the Denver district, with headquarters in the Jacobson Building, Denver, Col. He was formerly associated with the J. George Leymer Engineering Works Company, Denver.

A. L. Lovejoy has resigned as sales manager of the New York office of the Pratt & Whitney Company, to accept the management of the Chelsea Division of the Flanders Mfg. Company, with headquarters at Chelsea, Mich., to take effect March 1.

The Pittsburgh Coal Company and Colonial Coke Company announce that J. C. Barnhisel has been appointed their district sales agent, with office at Sault Ste. Marie, Mich.

The resignation of T. G. Bennett as president of the Winchester Repeating Arms Company, New Haven, Conn., was announced at the annual meeting February 8, and was accepted by the Board of Directors with much reluctance, and only after Mr. Bennett's insisting that he did not desire to be so active in a business way in the future. A new office, that of consulting director, was created for him. George E. Hodson was elected president and treasurer; Winchester Bennett, first vice-president; Harry S. Leonard, second vice-president; Aro I. Ward, secretary. No change was made in the Board of Directors.

E. F. Lake, Avenue B and Forty-seventh street, Bayonne, N. J., announces that he has severed his connection with the *American Machinist* as steel editor, and will hereafter act in the capacity of a special correspondent and consulting metallurgist. Expert advice will be given on the melting, alloying, casting, welding, heat treating and testing of metals, on the kind of metal best adapted for tools, and the moving or stationary parts on all kinds of machines or machinery and on the shop equipment required to perform this work economically and correctly.

A. Bickel, formerly contract manager of the Freeborn Engineering & Construction Company, has accepted the position of president of the Commercial Construction Company, whose principal offices are at Kansas City, Mo., and is engaged in a general line of municipal and private construction work.

J. A. Tyrie of the Michigan Twist Drill Company, Detroit, Mich., has been elected secretary and treasurer of the company, and C. E. Price, formerly superintendent of the machine shop of the Ford Motor Car Company, has been made factory manager.

Wm. R. Downey, formerly in the purchasing department of the Detroit Screw Works, Detroit, Mich., was recently elected secretary and treasurer of the Vincent Steel Process Company of the same city, with full charge of the company's business.

H. T. Fisher has taken a position with the Wells Brothers Company, Greenfield, Mass., as sales manager, starting February 1. He succeeds Edward Blake, Jr. Mr. Fisher was formerly connected with the same company, leaving some six years ago to accept the management of the Granite State Mowing Machine Company, Hinsdale, N. H., with which company he has been connected until the present time.

Lewis N. Rancke, formerly manager of the Baltimore Retort & Fire Brick Company, Baltimore, Md., has become associated with the engineering department of the Laclede-Christy Clay Products Company, St. Louis, Mo.

John Fritz, Bethlehem, Pa., had conferred upon him at the Founders' Day exercises of Temple University, Philadelphia, Pa., on February 11, the honorary degree of Doctor of Science, announcement of which was made by Dr. Russell H. Conwell, president of Temple University, at the testimonial dinner given to Mr. Fritz by the Manufacturers' Club in that city on November 17, 1910. The degree, owing to Mr. Fritz's inability to attend the exercises, was conferred *in absentia*.

J. G. Grant of the Grant-Wood Company, Chelsea, Mich., sailed for Europe February 8, to be absent several weeks.

C. A. Byers, Philadelphia, Pa., has assumed the management of the Baltimore Retort & Fire Brick Company, Baltimore, Md. He was associated some years ago with the Cyrus Borgner Company, Philadelphia, manufacturer of fire brick and clay retorts, and is a practical gas engineer.

Frank M. Eaton, resident partner of Hickman, Williams & Co., Cincinnati, Ohio, will sail from New York next week for a few weeks' vacation on the Isthmus of Panama.

Wm. F. Carroll has been appointed master mechanic for the New York Central Lines, with headquarters at Rochester, N. Y., succeeding F. W. Steel, resigned.

E. W. Mudge of E. E. Mudge & Co., iron and steel factors, Frick Building, Pittsburgh, has returned from Europe.

E. T. Weir, president of the Phillips Sheet & Tin Plate Company, Weirton, W. Va., has returned from Europe.

Jay I. Andrews, sales agent of the American Sheet & Tin Plate Company, Pittsburgh, has returned from an extended visit to the Pacific Coast.

The fortnightly bulletin of the American Railway Association shows that on February 1 the net surplus of idle cars on the lines of the United States and Canada stood at 155,068, compared with 114,820 two weeks before. The increase was 40,248, or 35 per cent. A year ago, at the opening of February, the surplus of equipment was 24,975, but since that time 100,000 new cars have been added, and the weather conditions this month are much more unfavorable than in February, 1910. In February, 1909, the number of idle cars was 301,283.

It is denied that the United States Steel Corporation is planning for the building, through the American Bridge Company, of a large bridge shop in the Birmingham, Ala., district. Another report, equally untrue, is that the Steel Corporation will build a bridge plant near Havre de Grace, Md.

Our Trade with Latin-America*

Much Already Done in Steel and Other Lines—Our Consular Service and Business Methods Commended

BY JAMES A. FARRELL.

The International Union of American Republics, commonly called the Pan-American Union, its distinguished Board of Directors and its competent, zealous and efficient general director, John Barrett, together with the assistant director, Francisco J. Yanes, are to be congratulated upon this great gathering of representative business men, interested in promoting trade and commerce between the countries comprising Latin-America and the United States.

The Need of Outer Markets

As any one who studies the progress of nations can perceive, the producing capacity of the United States has reached a point far exceeding the consumption, and the ratio of excess is assuming greater proportions each year. It is, therefore, imperative for the manufacturers of this country to look beyond its borders for markets wherein they can profitably dispose of their manufactures; and naturally our geographical position points to the vast country lying to the south of us as a market which should enable us to secure a portion of the trade commensurate with our position as one of the foremost producing nations.

The possibilities for the consumption of American products in the markets of our neighboring countries have long been realized by the greatest statesmen, as well as the leaders in the economic and commercial enterprises of our country. To every one engaged in foreign commerce there comes a broader knowledge of human affairs and a better understanding of the relations of men and of nations than comes to those who are solely engaged in domestic or local enterprises.

Our Business Methods in South America

It has been the fashion to criticise American export methods indiscriminately; so, also, it has been the fashion to criticise the commercial methods of South American buyers. There are, doubtless, examples meriting criticism in both cases; but my observation extending over many years in the export business and based on a direct personal acquaintance with the world's markets, enables me to state that, generally speaking, the products of our country and the manner in which they are packed for shipment are equal, if not in many cases superior to, the products and methods of European manufacturing countries.

The improvement which is constantly taking place in the quality and character of American manufacturers is one of the reasons why our trade is constantly increasing. It is a fallacy to believe that quality does not count and that South America wants cheap goods. My experience is that when our friends want railway materials, bridges, building materials and a thousand and one other things, they are as well able to recognize quality and as competent to determine their necessities as we are.

The business methods of our friends to the south of us do not differ materially from ours, excepting that they are rather more conservative. It is more difficult to secure business connections there than in our country, but once secured and mutual confidence established, it is of a permanent character.

Cultivating Closer Relations

The countries comprising what is commonly called Latin-America should be drawn closer to us by ties of friendly relation and brotherhood, cemented by a generous exchange of commodities through the peaceful channels of trade and commerce. As fair dealing is the only foundation upon which a sound and successful enterprise can be established, none but those of undoubted character and business ability should be sent to represent American industrial enterprises. In our relations with Latin-America, this thought should be uppermost in the minds of those of our merchants who would seek a market in those countries. The patient cultivation of our trade will carry with it rewards of great mutual advantage.

Since the establishment of the Pan-American Union, much has been accomplished to develop trade with those countries. Our neighbors have always found in the United States the greatest and best market for their products, statistics showing that we have given them more in trade than we have received; the reason for this being that, until comparatively recent years, we, as a nation, have been largely interested in the internal development of our natural resources, and have given little thought to the development of foreign trade, except as our requirements of necessities impelled us.

The growth of our country's trade with the Latin-American Republic furnishes a striking example of what can be accomplished by commercial friendship and co-operation. It is beyond the scope of this address to do more than briefly outline the nature and value of the trade between us. The establishing of American banking facilities and American steamship lines are incidental matters which will be evolved in the course of time.

The completion of the Panama Canal will give a wonderful impetus to Pan-American trade. It is impossible at this time to estimate fully the benefits that will accrue to the manufacturing and industrial interests of the United States and Latin-America. We are justified in believing that it will undoubtedly prove one of the most profitable investments ever made by our Government, aside from its being a national necessity.

Trade Balance Against the United States

The United States Government statistics for the calendar year 1910, recently published by the Department of Commerce and Labor, show that our trade with the countries embraced in the Pan-American Union, in round figures, was as follows:

Imports	$394,000,000
Exports	260,000,000
Balance against United States	$134,000,000

This adverse balance is largely accounted for by the figures of our commerce with Brazil, which were in round numbers:

Imports	$103,000,000
Exports	25,000,000
Balance against United States	$78,000,000

While I have not at hand the latest statistics of the total amount of the trade of other countries with those embraced in the Pan-American Union, it will be interesting to note the comparison of the figures for steel products alone, for which reasonably close approximations are obtainable. In 1910 the manufacturers of the United States exported to the Pan-American Union steel products of an aggregate value of $21,000,000, as against a total of $35,000,000 exported by European manufacturers to the same countries.

We are a great manufacturing nation, and as such it is only reasonable for us to look to our neighbors for a fair exchange of our commodities in return for those we obtain from them. Up to within recent years a large percentage of our country's exports came to our manufacturers without any particular effort; in late years it has been necessary for our manufacturers to study for-

* An address before the Pan-American Conference, Washington, D. C., February 13, 1911.

eign markets. To be successful our manufacturers must have a fuller knowledge of their requirements and keep in closer touch with their customers. Such contact places them in a more intelligent position respecting our resources and products, and promotes an intercourse which is mutually beneficial. System, purpose and organization are the only things that count in the long run.

The American Position as to Credits

The delusion exists that the trade of the United States with foreign countries is carried on within narrow limits. Among others, the claim has been made that we do not extend credits, and, in consequence, a large volume of trade goes to Europe which would come here, were we to grant credits of six to nine months. In the great majority of cases, credits such as referred to are granted only against acceptance of drafts, with interest added for the accommodation; but the bulk of the business done with the best buyers, wherever found, is either against bank credit, or cash against shipping documents. Wherever there is a basis for credit, American manufacturers will be found as ready to grant it as Europeans.

It is only within the past few years that we have had direct lines of communication from the United States to many South American ports. The growth and development of trade and commerce between the United States and the countries of Latin America has now been increased to such proportions that there are frequent mailings between ports of the United States on the Atlantic and Gulf coasts direct to the ports of Latin-America, on both the East and West coasts.

In the development of our trade, we should endeavor to obtain our full share of business by fair and honorable means and with due regard to the rights of those with whom we are trading. That "competition is the life of trade" is almost a daily utterance. Were this changed to "Fair competition is the life of trade," it would more correctly represent the basis upon which sound and lasting business relations may be established.

If we investigate the commercial and economic history of the countries that have made the greatest strides in ancient and modern times, we will find that their governments and statesmen have given their best thought, energy and support to foster and protect their interest at home and seek markets abroad.

The Pan-American Union is performing a great work for the advancement of trade, commerce, peace and civilization, and it is to be hoped that the respective governments will continue to support the movement, so that a lasting good will may be established through the peaceful contests fought out in the channels of trade and commerce.

Consular Service Improved

This occasion should not be allowed to pass without a word of congratulation to the commercial world, and more particularly our distinguished President and Secretary of State, on the decisive and effective position held during recent years toward the perfection of our diplomatic and consular organization. The commercial world is watching our consular service and the efforts of the Government to keep this most important branch of our foreign representation on a merit and business basis.

Our consular service has grown and developed in recent years under the present policy of the Government, so as to merit the confidence of our citizens at home and abroad. We should not forget that this service remains the one organized expression of our country in the stupendous economic contests which are now engaging the nations of the earth in competition. The commercial interests of the United States should guard it jealously, and support and fortify in every possible manner the splendid work of Secretary Knox and Director Carr in their efforts to maintain and improve it.

The Department of Commerce and Labor has also in recent years achieved splendid results by sending special agents throughout the world to report on business and economic conditions with a view to the promotion of our country's trade and commerce with foreign countries. This work should be encouraged by the commercial interests of this country in every possible way.

As a business proposition alone, the emoluments of every consulate on the list, where conditions recommend its continuance, should be markedly advanced. Our consular service is highly efficient, and no just criticism can be made of it; but men tire of working for glory alone. The service should be fixed by statute on a permanent basis, and salaries paid commensurate with the importance of the work and the pretensions of our country.

I am one who believes the American Consular Service is the best in the world. I have met many consular officers and I have invariably found them interested in their work and appreciative of the significance of American commerce.

In this connection, the thought is suggested that the consular organization might be used in a direct manner for the dissemination of information concerning American manufactures and exports in a wide and comprehensive way. This could be done by establishing a consular trade bulletin, to be published by the Government in several different editions and in different foreign languages, listing the standard American exports, with specimen prices and other information, as indicated by bills of lading and invoices at the point of shipment. Such a publication, being of a statistical character and bearing the imprint of the United States Government, would be received without prejudice in every market of the world.

The American Iron & Steel Mfg. Company's Annual Report

The balance sheet given in the eleventh annual report of the American Iron & Steel Mfg. Company, Lebanon, Pa., showing the financial condition of the company December 31, 1910, compares as follows with that of the previous year:

	1910.	1909.
Assets.		
Cash	$1,025,061.76	$596,101.84
Bills receivable	11,258.04	11,553.04
Accounts receivable, net	576,322.06	673,302.99
Inventory	1,587,642.97	2,143,183.40
Insurance and taxes, unexpired value	6,237.41	7,300.46
Fixed assets:		
Real estate, plants and equipments, less allowance in 1910 of $855,000 to provide for depreciation	4,936,635.62	4,870,166.86
Totals	$8,143,157.86	$8,301,608.59
Liabilities.		
Preferred stock	$3,000,000.00	$3,000,000.00
Common stock	2,550,000.00	2,550,000.00
Wages accrued, not due	None.	90,998.02
Accounts payable	None.	134,728.89
Undivided profits at this date subject to the payment of dividends on preferred and common stock, authorized but payable in January	2,593,157.86	2,525,881.68
Totals	$8,143,157.86	$8,301,608.59

President James Lord says: "As compared with the previous year the demand for our products was greater, with prices much lower than prevailed during the last half of 1909. Additions were made to plants and equipment amounting to $116,469."

A Bill to Legalize the Boycott

The line of legislative effort by organized labor at the present session of the New York Assembly is indicated by a bill just introduced at Albany, inserting five new sections in the labor law. It punishes by fine or imprisonment any company or officer compelling persons to refrain from membership in a union as a condition of securing employment. It permits the boycott by providing that agreements or contracts between persons to do or not to do any act in contemplation or furtherance of any trade dispute between employers and employees in the State shall not be deemed criminal and shall not be punished as a conspiracy unless such acts would be criminal if committed by one person. It makes it a misdemeanor to advertise for workmen to take others' places without stating that a lockout exists. Strike breaking is also prohibited by making it a misdemeanor to hire persons to carry arms and to guard property, without the consent of the Governor.

Canada's Steel Bounties May Be Renewed

TORONTO, February 11, 1911.—A statement made by the Canadian Finance Minister on Wednesday strengthens the expectation that the Dominion Government will shortly introduce legislation to provide for a renewal of some of the steel bounties. The statement was made in reply to a large deputation from Morrisburg, Ont., that presented a petition for a bounty of $5 a ton on sheet steel manufactured in Canada. The request was made in behalf of the Sheet Steel Company's industry in Morrisburg. The Finance Minister said that the Government desires to get rid of the bounties, but he promised to give the petition careful consideration. He added that the Government would not grant a bounty on goods for exportation. Altogether the answer, especially the latter part of it, was encouraging. The Minister, who some months ago intimated rather positively that there would be no more steel bounties, will now go no farther than to negative the idea of bounties on goods for export.

As the bounty law formerly stood, exportation was not a ground for the forfeiting of the bounty, except in the case of certain articles. To draw the bounty on wire rods, manufacturers were required to use them for the making of wire in this country. Steel blooms and steel billets made in Canada could not be exported without return of whatever money had been paid as bounty on the steel ingots from which they were produced. But the rail bounty, which was discontinued some years ago, was payable to manufacturers, whether the rails were sold at home or abroad.

On the day the Finance Minister received this deputation he was asked in the House by a private member whether the Government had changed its intentions as to bounties in future. The reason for making this inquiry was the report that a conference had been held in Montreal between the Finance Minister and the president of the Dominion Steel Corporation, and that the question of bounties had been discussed. The Government was also questioned as to whether many petitions had been received for the abandonment of the bounties. In reply the Finance Minister said that representations had been made to him by the president of the Dominion Steel Corporation with reference to obtaining a bounty on steel rods. Whatever decision the Government should come to would, said the Minister, be announced in the House. On this question, he said, as on all matters relating to the fiscal policy of the Government, there were differences of opinion throughout the country.

Both the Sheet Steel Company and the Dominion Steel Corporation base their case for bounty on changes that are provided for in the reciprocity agreement whose ratification is pending at Ottawa and Washington.

C. A. C. J.

The National Electroplaters' Association

The National Electroplaters' Association of the United States and Canada, an organization composed of electroplaters and electrometallurgists, held its second annual banquet at the Hotel Marlborough, New York, on the evening of February 11. The organization is an educational society formed to pursue the study of electroplating and discuss subjects for the improvement of shop practice. Several hundred members from all parts of this country and Canada attended. Addresses were made by Dr. Joseph W. Richards, professor of electrometallurgy, Lehigh University; Erwin R. Sperry, editor of the *Brass World*, Bridgeport, Conn., and George M. Howard, chief chemist of the Electric Storage Battery Company, Philadelphia, Pa.

The Foster Bolt & Nut Mfg. Company, Cleveland, Ohio, is erecting a two-story brick addition to its shipping department. This company is now manufacturing a full and complete line of stove bolts, stove rods and rivets.

The Republic Iron & Steel Company will blow in the third furnace of its Thomas, Ala., group February 25. It has been out for some weeks for relining.

Machine Tool Awards at the Brussels Exposition

Our Berlin correspondent furnishes the following: "At a dinner recently given here to Privy Councillor Albert, the German commissioner to the World's Fair at Brussels, that gentleman referred to the splendid showing made by the German exhibits there by reason of the scientific thoroughness and exactness that characterized them, and added: 'I will single out only one section of the German division—namely, the machine tool trade. We all know what we have learned in this trade from the Americans, and that we are still engaged in a particularly sharp competition with America. It is, therefore, especially interesting to note how this competition turned out at Brussels, where the Americans limited their exhibits substantially to machine tools. The class jury—that is, the jury composed exclusively of experts—awarded Germany 10 first-class prizes, Belgium 5, Great Britain 4 and the Americans 2. I don't think I could bring forward better proof of how we steadfastly keep our goal in view and work for the intelligent perfecting of a difficult process of production.' The American machine tool manufacturers can see from this what their pupils, the Germans, are now saying after having learned their lesson from the Americans, and having, as they think, outstripped their masters."

Apparently some error has been made with regard to the number of prizes awarded to American machine tool manufacturers at Brussels. Alfred H. Schutte, who represents at Berlin a number of American machine tool manufacturers, cables that Americans received 33 prizes through his exhibits alone.

The Krupp-Midvale Suit Dismissed.—Judge McPherson in the United States Circuit Court at Philadelphia on February 13 handed down an opinion dismissing the bill with costs in the case of Fried Krupp-Aktien Gesellschaft against the Midvale Steel Company. The court's finding was based on the lack of evidence to sustain the charge of infringement averred by the plaintiff company, which alleged that the Midvale Company was infringing on its rights by using a process in the manufacture of armor plates which the former declares is its own invention. The attorney for the Midvale Company argued that the loss alleged by the Krupp concern was purely speculative; that the process in dispute had been in use by the Midvale Company for years prior to the filing of the suit. He also alleged that no injunction could be issued because the patent rights of the process have expired since the proceedings were begun.

The Detroit Bridge & Steel Works, Detroit, Mich., which was organized some months ago, has completed its plant at Delray, a few miles south of Detroit. The plant has a capacity of 12,000 to 18,000 tons of fabricated steel a year. Considerable work is now going through the shop, several local building and bridge contracts having been recently secured, the latest being the steel work for the addition to the Pingree Building, Detroit. The officers of the company are as follows: Max J. L. Fowler, president; W. E. Brinkerhoff, secretary; Richard P. Joy, treasurer; C. A. McLees, assistant treasurer. All the active officials of the company were formerly identified with the old Detroit Bridge & Iron Works.

In the foundry of the Charter Gas Engine Company at Sterling, Ill., February 7, as a large pulley for an 80 hp. heavy duty pumping engine was being poured, the pressure of the molten iron broke an iron clamp and raised the cope. The metal poured over the floor, but fortunately none of the workmen was seriously burned, though faces, hands and arms were scorched. The anchor, sand and cope, together with an 1800-lb. weight upon it, aggregated over 4 tons, all being lifted like a feather after the clamp gave way.

George W. Connors, Atlanta, Ga., formerly secretary and treasurer of the Atlanta Steel Hoop Company, has bought from the Republic Iron & Steel Company the old Birmingham Rolling Mill at Birmingham, Ala., and is having it dismantled.

The National Machine Recorder

A New Device for Recording the Idle and the Running Time of Machines

An improved form of recorder for furnishing an accurate report of the movement of every machine tool in a shop has been brought out by the National Machine Recorder Company, Marquette Building, Chicago, Ill. The special improvements made in the machine are an view of the improved type of machine and Fig. 2 is a

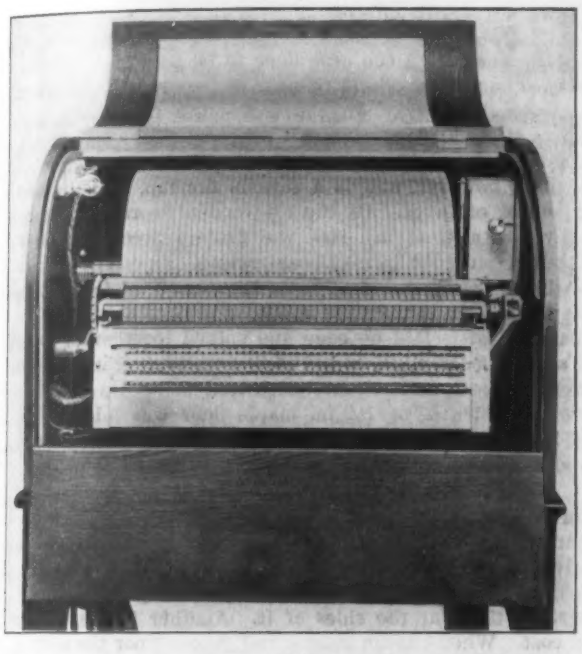


Fig. 1.—A New Type of Recording Instrument Made by the National Machine Recorder Company, Chicago, Ill.

adding attachment and a time setting device. Fig. 1 is a specimen chart giving a record of the idle and the operating time of a number of machine tools obtained from the device.

The adding attachment computes the net running or idle time of each machine in the shop. Each producing unit has a separate counter which shows distinctly in large figures the net amount of time the machine has been turning out work, or, if desired, the idle time that has occurred at any particular interval during the day. At the end of the day this is all totaled automatically by the machine, thus eliminating all clerical work. The time setting device, which is the more important of the improvements, automatically allows a fixed time for performing an operation. It records on the chart and adding wheels only such time as is consumed in excess of the amount for which the device is set. If, for example, a certain operation requires 30 seconds for putting the work in place and removing it from the machine and 50 seconds actual running time of the machine, the time setting device for this particular machine would be set at 1 minute 20 seconds, and would not record any idle time unless the operator was slow and consumed more than the allotted amount of time. A glance at the recorder serves to indicate just which operators are not coming up to the required efficiency. The idle time shown is that consumed in avoidable delays, as the legitimate time for handling work is not recorded, and the chart shows whether the delays are due to repairs or reasons beyond the operator's control.

Fig. 2 is a reproduction of a chart taken from one of the machines in actual operation, and illustrates results that can be obtained in a shop where the various operations have been standardized. Where the actual running and the actual preparation time for different operations has never been ascertained, it will, of course, be necessary to compile data obtained from the chart until such time as the standard allowances for handling the work and machining it can be determined. Machines 1 and 2 are lathes, both of which are turning out the same piece of work. From the chart it will be noticed that one produces 15 and the other 18 pieces per day. By checking the matter further, it will be found that one lost 60 minutes running time and 105 minutes preparation time, or a total of 2 hours 45 minutes, while the second lost 50 minutes running time and 37 minutes of preparation, the total loss in this case being 1 hour 27 minutes. Machine No. 8, which is a planer, turned out 19 pieces with a total loss of 55 minutes a day, divided into 19 minutes operating loss and a preparation loss of 36 minutes. This was the best showing made by any of the 15 machines connected to the recorder. No. 9 is a traveling crane, and as this is not only a valuable piece of machinery but is also accompanied by a number of laborers, a record as to the proportion of the day that it was actually in use is highly desirable. These records were taken in a shop that has a higher average than the general run, and the losses shown on this chart are said to be very light as compared with those shown by the charts when the machine was first installed. In this case 25 per cent. is a conservative estimate of the time saved.

In use the recorder is located in the superintendent's office and will record the operations of 50 machines simultaneously. Each machine is connected by a separate wire to its respective marker and these cannot be tampered with by an employee. The charts obtained from the recorder will show just how long it has taken a workman to pick up a part from the truck or floor and insert it in his machine, the length of time required to perform the operation and the amount of time consumed in taking out this part and inserting the next one. Other features of the chart are that it will show whether or not a variable speed motor is being operated to the best advantage, as well as the length of time consumed in taking both roughing and finishing cuts.

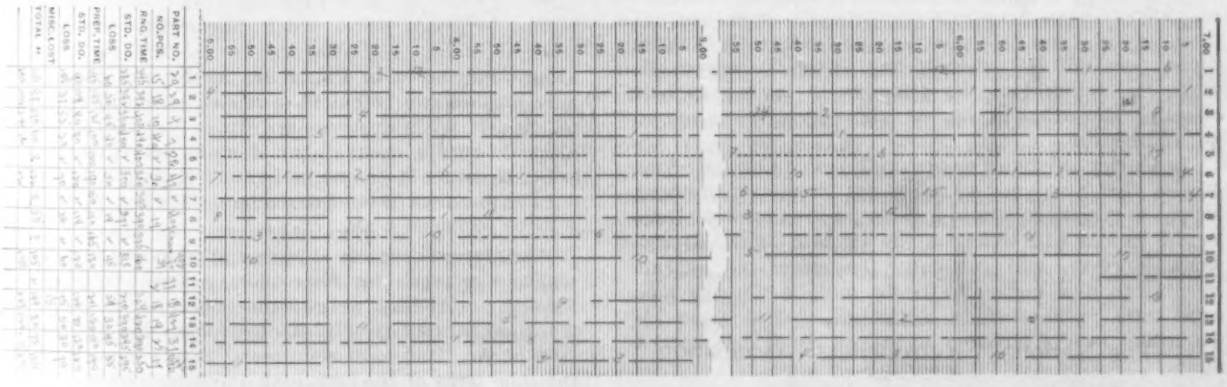


Fig. 2.—Specimen Chart Giving a Record of the Table and the Operating Time of Machine Tools Obtained from the Recorder.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, has elected E. W. Crellin, president; G. A. Smith, vice-president, and W. H. Jackson, secretary and treasurer. B. N. Moss, the former secretary and treasurer, has disposed of his interest in the company to Messrs. Crellin and Jackson, with whom he has been associated for 11 years. He will take a vacation, leaving March 1 for a trip to Panama and California.

Shop Floors—II

Materials and Methods of Construction, with Particular Reference to Foundry Floors

BY H. M. LANE.

Soft Floor Surfaces

In certain operations where delicate work is being handled some manufacturers prefer a fairly soft floor, so that if the work is dropped it will not be damaged or broken. If the shop is of concrete construction, the floor slabs can be faced with asphalt or wooden surface floors can be used. The application of these to concrete slabs will be discussed later.

The asphalt top which is laid on floors is practically dustless, is waterproof, and is no heavier than the top dressing of concrete, which is sometimes called "granolithic" dressing. In making this material the asphalt should be melted in kettles and to it should be added an equal bulk of sharp grit or sand. This should be well mixed, heated to about 300 degrees F., spread on the concrete surface with wooden spreaders and struck off to a layer 1 in. thick. When cool the surface should be covered with fine sand or dry Portland cement and rubbed smooth with a wooden rubbing trowel or with a hot metal burnisher like that used in laying the ordinary asphalt pavement. When laying this asphalt on concrete surface it is well to wash the surface of the concrete first with a mixture of molten tar and asphalt. This mixture should contain enough asphalt so that it will be fairly hard when cold, but still slightly plastic so that it will bind with the hot asphalt material.

A floor of this kind for interior shop use has the advantage that the composition can be made such that it will always have the proper resilience at shop temperatures, for as a general rule the temperature of working rooms does not fall much if any below 60 degrees F., while the contractor who attempts to lay an asphalt street pavement has to contend with very extreme ranges of temperature.

In moving machines or material upon an asphalt floor of this kind care must be taken not to allow any heavy weight to rest on rollers in a given position for some time, as the rollers will sink into the asphalt. Such depressions, however, will gradually disappear, the asphalt seeming to flow under the traffic until it fills the hole once more. This surface is dustless, and as small indentations have a tendency to smooth out it has marked advantages over a concrete surface. The asphalt surface is also a much poorer conductor of heat than concrete, and hence feels warmer under the workmen's feet.

In the case of upper floors of factories when an asphalt surface is used over a concrete slab, it cannot be depended upon to take any of the compression in the upper surface, and hence becomes a dead weight on the floor; but this dead weight will scarcely exceed one-third of the dead weight of a wooden top floor. The asphalt surface is much cheaper than wood, and as it is lighter, in a multiple story structure it has the advantage that it tends toward lighter construction in columns, girders and floor slabs. It is undoubtedly true that this surface will become more popular in the future than it has been.

Direct comparisons as to the cost of concrete, asphalt and wooden surface cannot be given, on account of the great differences in cost of these materials in different portions of the United States. Nor can the exact mixtures to be used in asphalt be given, since so many different grades of asphalt are used. Wooden flooring also varies greatly in price in different parts of the country, and on the Pacific Coast, where there are no native hardwoods, fir is generally used as a top flooring. It gives fair results, though it splinters badly when compared with maple.

Wooden Floor Surfaces

In considering the best floor to be used in a factory above the ground floor a number of factors must be taken into consideration. In the early day factories heavy joists stiffly bridged with a thick plant floor on top were very common. This floor contains a large amount of lumber, however, and is a serious firetrap, hence it has gone out of favor. Of the all-wooden floors with some provision against fire risk the first to become popular was that adopted in mill construction. One type of this is shown in Fig. 1. Heavy timbers were used for girders on column lines and either 2 x 4 or 2 x 6 in. pine or hemlock joists laid on edge and spiked together to form a solid wooden floor, as in the illustration. These pieces were dressed to uniform width and after the sub-floor was placed a ⅞ or 1⅛ in. maple floor was laid on top of it. The older system always laid this floor diagonally and also used tongue and grooved flooring, as shown.

Modern building methods avoid the tongue and groove, for the reasons already given and also always place the hardwood top floor at right angles to the sub-floor. One advantage of the tongue and groove is that of local repairs, as any given board can be pulled up without disturbing those at the sides of it. Another is the saving in cost. When buying tongue and groove floor the actual face width of the flooring is much less than its nominal width, so that the manufacturer pays for his tongues and grooves twice so far as the floor surface obtained is concerned. For this reason the square edged boards are cheaper.

The floor shown in Fig. 1 has many advantages, as light machines can be bolted to it and work can be handled over it without difficulty. In a factory equipped with sprinklers a floor of this kind is practically fireproof. Of course it has no moisture resisting properties, but a wooden floor should never be used where moisture has to be reckoned with.

As reinforced concrete is becoming more and more the recognized material for floor slabs, methods have been evolved for attaching wooden top floor to this. One of these is illustrated in Fig. 2. The floor slab proper is shown at A. The main reinforcing rods appear in section in the front of the illustration and the smaller cross rods in section at the right. The floor slab proper is poured and struck off to its full thickness. The wooden strips or screeds E should then be placed in position and spaced 18 in. apart, or whatever distance the architect specifies. The space between the screeds should then be filled with concrete, B. This should be applied before the lower slab, A, has hardened, in which case the material between the strips E will be thoroughly bonded to the slab A and will assist in taking some of the compression in the slab. If the cement filling is not placed in position until after the slab has fully hardened, the material between the strips will not take any of the compression and simply becomes a dead weight upon the floor. After the floor has set, the sub-floor of planks, C,

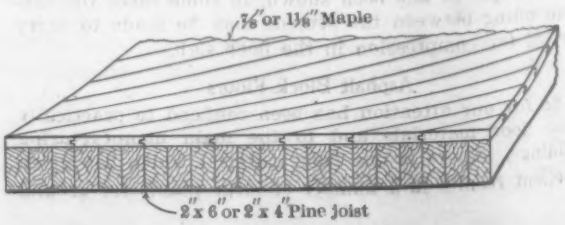


Fig. 1.—A Floor Used in Mill Construction.

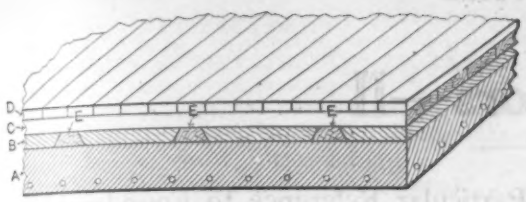


Fig. 2.—Method of Attaching Wooden Top Floor to Concrete Slabs.

is spiked to the strips E and the planks bear on the concrete their entire length.

Some advocate the use of tar or tar paper under the plank floor and on top of the cement B. This is not good practice in most cases, as it is pretty sure to result in dry rot in the planks C and the strips E. It takes several weeks or possibly months for a concrete slab to dry out thoroughly, depending, of course, upon weather conditions, and hence the top floor, D, should not be laid until the slab is thoroughly dry. When it is necessary to get into the factory quickly, we have known cases where the firm has moved in on top of the sub-floor C and worked on it for several months before the top floor D was laid.

THE WORKING SURFACE.

The top floor or working surface should be of ⅞ or 1¼ in. maple, in boards not over 4 in. wide, with square edges; the bottom of each board should be double plowed so that it will have three bearing strips the entire length. The sub-plank C should be nailed to the strips E with nails of sufficient length so that they will pass practically through the strips E; the wearing surface D should be nailed to the underlying plant with 8-penny wire floor nails. These nails should be placed in diagonal rows, so that they will come into different plank in the lower floor, and two nails should be put in each floor board in each row. The rows of nails should be not more than 18 in. apart. A floor laid in this manner after the concrete slab has thoroughly dried will last indefinitely, so far as decay is concerned.

So far very few experiments have been tried in this country in treating the timber for the sub-floor, or the strips E, but we believe that if these were treated with creosote or some other preservative far better results would be obtained in the life of such floors. With maple surface floors there seems to be little object in treating the material, but if maple cannot be obtained some of the softer woods properly treated have better wearing qualities than the wood untreated.

One large manufacturing concern in the East states that its standard wooden floor laid on tar concrete in a manner similar to that described above costs 40 per cent. more than a concrete floor which is used in some departments, and that it is much shorter lived than the concrete.

Gravel concrete or broken stone concrete may weigh as much as 150 lb. per cubic foot. Cinder concrete weighs about 120 lb. per cubic foot. Asphalt surfacing material weighs about 130 lb. per cubic foot in place, hemlock plant approximately 30 lb. per cubic foot and maple 60 lb. per cubic foot. Using these figures, we find that a 1-in. concrete surface will weigh between 12 and 13 lb. per square foot, and, as already shown, when properly laid assists in carrying the compression in the floor slab. A square foot of asphalt surface 1 in. thick weighs 11 lb. and is simply a dead weight on the floor. A square foot of wooden floor composed of a 1-in. maple top, 2-in. hemlock sub-floor and the necessary screeds and cinder concrete filling weighs about 27 to 30 lb. per square foot, and is generally a dead weight on the slab, though, as has been shown, in some cases the concrete filling between the screeds may be made to carry part of the compression in the floor slab.

Asphalt Block Floors

So far our attention has been confined to practically three floor materials and to the main manufacturing buildings. There is one floor material which has given excellent results in a number of large plants for ground floor work. This is known as asphalt block and is made by the New Castle Asphalt Block Company, Pittsburgh, Pa. These blocks are made from Trinidad Lake asphalt and hard blue limestone. The material is compressed by machinery into blocks about 4 x 4 x 12 in., though the size may be varied for different purposes. The writer has seen a number of these floors in use, some of which have been in continuous service for 12 years, and have given excellent results.

In two large plants in the Pittsburgh district, where very heavy machinery was handled, the blocks were laid on a layer of concrete without any sand between the blocks and the concrete. The underlying soil was largely filled ground, which had had several years to settle. The layer of concrete varied from 4 to 12 in., depending upon the weight to be carried upon the various floors. The individual blocks have something of the elastic property of an ordinary asphalt pavement, are not easily shattered, and to some extent seem to recover their form after dents or injuries have been made upon them. The hard blue limestone presents an excellent wearing surface, so that these have given very good results even in heavy traffic runways. It is unnecessary to say, however, that in a shop of the character of that being described most of the material is handled by traveling cranes or on cars running on tracks, as when the pieces run into tons it is impossible to handle them on ordinary floor trucks.

In some cases the asphalt blocks have a layer of sand an inch or more in thickness placed on top of the concrete before the blocks are laid. This has a tendency to protect the floor from sudden blows at any given point due to the careless handling of heavy weights. The asphalt block floor has very marked advantages over an ordinary asphalt floor, in that it is susceptible of unit repairs as readily as a wooden block floor.

While on the subject of asphalt, we may say that any asphalt floor or asphalt floor surface can be mended or patched as easily as an asphalt street pavement, an advantage which concrete has in less degree. Concrete is the material par excellence for resisting strains and carrying loads. Asphalt in its various forms is useful on account of the fact that it presents a more or less flexible floor surface, and one which will resist moisture better than either concrete or wood. It is not suitable for rolling heavy loads over or for laying heavy castings upon, as they will slowly settle into the asphalt surface. For comfort, silence, easy trucking and protection of work there is undoubtedly no floor equal to a good wooden floor with a maple top, but this is expensive and short lived compared with some of the others.

Forge Shop Floors

Turning our attention to the other departments of the works, we are confronted with the requirements of the forge shop and the foundry. In the forge shop heavy weights must be handled and the floor must not be injured by hot forges. This rules out concrete, wood and asphalt, and leaves only brick as a paving material for the blacksmith shop. For light work in drop forge shops a floor of paving brick is satisfactory. This should be laid on a cushion of sand, which in turn should be underlaid with concrete or rolled cinders. For heavy work, forge shop floors should consist of cinders or clay rolled hard. If the ground is damp provision should be made for draining it, and if necessary a layer of tar concrete introduced 18 in. or 2 ft. below the floor level simply as a dam to prevent moisture rising.

Iron plates are used in some forge shops and are in general use in rolling mills. These undoubtedly form the best surface for handling long pieces of hot iron, but would not be satisfactory for handling heavy hot forgings, as the plates would be warped and bent by the heat and the effect of hot plates upon the men's shoes would not be conducive to comfort.

FOUNDRY FLOORS

When we turn to the foundry we are confronted by a number of problems. We must decide what is the best floor for a malleable foundry, annealing room, for cupola charging platforms, for foundry runways, for pouring

floors, for molding floors and for cleaning rooms. The conditions in all of these cases vary more or less.

Annealing Room Floors

For a malleable annealing room the floor must be capable of resisting heat which comes from the dumping of hot pots or the setting of stacks of hot pots upon it. It must also be capable in most cases of resisting heavy traffic, for usually the annealing pots are charged with a special charging truck which runs on wheels over the floor of the annealing room. These conditions leave but two really satisfactory materials for the annealing room. These are iron plates and hard burnt shale brick. Where iron plates are used they should be slightly roughened to prevent their becoming excessively slippery. The presence of more or less charging material over the floor, however, serves to introduce a gritty medium and to some extent to prevent slipping. The plates are usually of cast iron and are embedded in concrete. A sufficient depth of concrete should be used to form a firm foundation capable of supporting heavy stacks of pots without any deflection of the floor. Where bricks are used they are generally laid on a concrete base, and in some cases are cemented to the base and to each other with a thin wash of cement and sand with which the floor is flushed after the bricks are laid on the concrete base. In other cases they are laid on a thin sand cushion. If the work is well done the writer favors the sand cushion, as it facilitates repairs.

In front of the annealing ovens large plates of wrought iron are usually used for the trucks to travel on, so as to protect the floor slabs of the annealing ovens. When charging the plates are placed far enough into the oven to protect the floor slabs of the oven from the wheels of the trucks. As charging progresses the plates are drawn back.

In many of the modern malleable foundries the stacks of pots are handled about the floor for shaking out and packing by means of a traveling crane, and in this case the travel of the charging truck is limited to the space immediately in front of the ovens. In some cases, however, pneumatic or electric charging machines are used which run all over the room handling stacks of pots from one place to another. These machines move at considerable speed and have rather small wheels, so that the wear on the floor is exceedingly heavy.

Cupola Charging Platforms

For cupola charging floors many materials have been tried and the selection will depend to a considerable extent upon the method of carrying out the work. Where the iron and coke are piled directly on the floor, considerable stock being carried on the platform, the surface should be such as to resist abrasion as much as possible. This practically confines us to plates, either of steel or cast iron. Plates of all kinds have a tendency to wear smooth and hence the upper surface should if possible be corrugated.

We know of one firm which uses channel irons laid with the flat side up and the flanges bolted together. The flanges rest on I-beams spaced about 6-ft. centers. There is enough irregularity in these narrow channels to afford ridges upon which the workmen's feet obtain a grip, while at the same time the differences are not sufficient to interfere seriously with trucking over the surface.

Where the charges are brought up on flat wheeled trucks and stored on the platform there should be a surface provided which is capable of standing heavy traffic. The iron plates are satisfactory for this, except that when they wear smooth they make the shifting of the trucks upon the platform difficult on account of the inability of the men to obtain a suitable footing. In some cases concrete floors have been tried, but these are not satisfactory. A concrete floor carrying a brick pavement presents a better surface than a simple concrete slab.

Where the material is brought up by a trolley system or upon railroad tracks, so that neither the wheels of the trucks nor the metal itself comes in contact with the floor, there is no material that will surpass concrete for a surface, as the slab that carries the tracks can be made to form a strong floor with a good wearing surface.

Foundry Runways

The subject of foundry runways was touched upon when treating the subject of runways in general. The selection of the material for any foundry runway will be governed by the method of carrying the iron or other metal to the pouring floors. Where the metal is carried to the floors by the trolley system and the castings are similarly removed, a concrete floor gives excellent results providing there is not much spilling of iron on it. Concrete, however, chips badly if it comes in contact with hot castings or large masses of molten metal, and for this reason paving bricks make a better runway.

Cast iron plates or steel plates having a rough surface are frequently used with good results. These are particularly advantageous when buggy ladles running on flat wheeled trucks are used.

Where the iron is all carried by hand, either in shank or hand ladles, a clay floor in the runways gives very fair results. These runways or passageways in the foundries are also frequently called the "marsh" or "mash," and no matter what the floor material is the runways should be thoroughly cleaned up each day and some provision made for taking care of the shot iron and other metal which accumulates upon them.

Foundry Pouring Floors

The subject of foundry pouring floors is governed entirely by the class of metal being handled and the size of the castings. In the case of the brass foundry provision should be made to save all shot metal or material spilled on the floor. This necessitates a hard floor surface without large cracks which can easily be cleaned. At the same time the floor surface should be such that hot crucibles can be set upon it without injury to the floor. This last condition eliminates the use of concrete, so that the only satisfactory materials left for a pouring room floor in a brass foundry or for the floor around the furnaces are paving bricks and iron plates. Both are extensively used. Where paving bricks are laid the square cornered type will generally be found better for a pouring room than the round cornered brick commonly used for street paving. The cracks in the brick floor in the pouring room should be filled with molding sand to prevent molten metal from finding its way between the brick, especially in case a crucible should burst.

For pouring floors in iron foundries we meet different conditions. Brass or bronze are usually poured from the same crucible in which they are melted and hence the outside of the crucible is approximately as hot as the metal. In iron foundries the metal is poured from a ladle the outside of which is relatively cool, and for hand pouring operations cement floors are usually fairly satisfactory, particularly when covered with an inch or so of molding sand before the molds are placed upon them. This molding sand also makes it easy to bed the molds in place. A number of large foundries are using this style of floor and report it to be very satisfactory indeed; in some cases castings weighing 2000 or 3000 lb. are poured on such floors. In the case of large castings, however, 3 or 4 in. of molding sand is generally placed around the flask to guard against a runout, and care should also be taken not to set heavy crane ladles directly on the concrete.

The writer in inspecting a concrete floor which had been in use more than five years in such a foundry was surprised to find the excellent condition of the surface. This seems to point to the fact that the life of a floor depends more upon the care with which it is constructed than upon any other feature. Of course the materials entering into the construction play an important part and the floor should have reasonable care taken to protect it afterward.

When shaking out hot castings on a concrete floor they should never be placed directly on the concrete, but several inches of sand should be shoveled onto the floor under them and the castings should be removed to the cleaning room as soon as possible. In one large foundry which was equipped with concrete floors the workmen had been in the habit of piling the castings at the end of each man's floor directly upon the concrete, with the consequence that the surface of the concrete at these points

was entirely destroyed and worn away to the depth of from 1 to 3 in. A little care would have prevented such unnecessary wear. In some cases cast iron plates are used in portions of the foundry, particularly where the castings are to be shaken out.

Clay floors have been used for the pouring department, and if the subsoil is dry and care taken to maintain them at a proper level they will wear very well, though they are not as neat or as easily maintained as concrete or brick floors. Paving brick makes a very good floor for the pouring department of an iron foundry, providing the work is not too heavy, so that large hot castings are liable to be left on the floor. Very heavy work is generally poured in pits or in large iron flasks which are frequently set in shallow pits. The conditions of such a floor necessitate changes in floor level with changes in the work, hence nothing but a clay or molding sand floor can answer these conditions. Large work, of course, is generally poured in the department where it is molded, particularly in green sand work. For this reason a clay floor, with or without permanent pits, is the best for heavy work pouring.

Molding Floors

For the molding floors in a foundry we are again confronted with questions as to the size of the castings, style of molds and other similar features. For machine molding a concrete floor or a floor of paving bricks gives excellent satisfaction. A floor of this kind gives a firm, hard surface to which the modlers can shovel and so maintains the floor at constant level. This prevents one man from digging up the floor and another from letting his floor build. The writer has frequently seen as much as a foot of difference in elevation between two adjacent floors operated by piecework molders, one of whom was likely to dig into the floor as he shoveled and the other to let his floor fill up. Of course these men were working on clay or molding sand floors. Had they been working on a hard surface floor they would both have worked over all of the sand and never cut into the floor.

For fairly heavy work such as is done on side floors in ordinary foundries a standard paving brick or concrete floor is excellent, the choice depending largely upon the method of shaking out castings and the care given in handling the floor, also upon the availability of high grade paving brick. The mistake has been made in several parts of this country of trying to make a foundry floor from ordinary red building brick. Such a floor has a very short life and is decidedly disappointing. The paving brick are what are known as shale brick, while building brick are soft clay brick. There is also a difference in the kiln treatment of the two and consequent difference in their ability to resist wear.

For the crane or heavy work bay of a foundry in which much pit work is not required a clay floor is usually satisfactory. If a certain amount of shallow pit work is to be done it is best to dig out that portion of the floor where such work is to be performed and to fill it in with molding sand, for as the pits are dug the molders are pretty sure to mix up the material from the pit with the sand and the hole is sure to be filled with molding sand when the operations are finished, so that in the long run it is generally cheaper to put the molding sand there in the beginning. We know of one foundry where the entire floor is filled to the depth of 10 ft. with molding sand. Of course there are cast iron pipe and car wheel foundries and other special types in which the molding and pouring is done under conditions differing from the ordinary gray iron foundry, and the conditions of such foundries are generally met with special designs. Cast iron plates or steel plates are not advisable for ordinary molding floors, as the concrete or brick floors are cheaper and answer the purpose just as well.

Cleaning Room Floors

When we enter the cleaning room of a foundry we are confronted with a floor proposition which has requirements more severe than any other department. Here rough castings and hot castings will be piled upon the floor, with the damage that might be expected. Concrete will not do. Cast iron plates seem to meet many demands better than any other floor that can be devised. The plates should be laid in masonry or concrete and should be sufficiently thick to resist wear and any tendency to buckle. A plate 1 in. thick will generally satisfy these requirements, though it should be heavily ribbed on the back. Such plates are generally cast in open sand and are frequently laid with the top or open sand surface up. This surface is not as smooth as the back would be, but the procedure permits the forming of ribs on the bottom of the plate and the rough surface of the top of the casting affords a better grip for the workmen's feet in the cleaning room.

Steel plates, if used at all, should be rolled with a rough or patterned surface and are only suitable for floors over which comparatively light castings are handled. Paving bricks make a fairly good floor for the cleaning room, and the ordinary street paving brick with round corners will do as well here as the square cornered brick, for it is less subject to breakage of the corners. If the castings are not hot when brought to the cleaning room a wooden block floor seems to give very good service in many cases. Plank floors are used in many cleaning rooms, but this is the poorest floor that can be used here and should be avoided wherever it is possible to do so.

In malleable foundries where the castings are brought to the floor practically cold and are mostly cleaned in tumbling barrels or by sand blast, and particularly where most of the castings are handled on trolleys, concrete floors give excellent satisfaction. With the same conditions concrete floors are good in the light gray iron foundry.

Wooden block floors give fair results in a cleaning room providing it is not so wet as to cause the floor to swell and buckle. Generally, however, the conditions are uniform in a cleaning room and whatever the surface is it soon comes to a constant condition of moisture.

For pickling room floors planks are frequently used, on account of the fact that concrete is affected by the acid, and while it is true that the planks are rapidly worn out, they offer a better resistance to the acids. Pickling vats themselves are generally made of wood or of concrete or masonry, and lined with sheet lead. The sheet lead covering should be protected by a rough wooden floor or wooden grating. Asphalt can be used between the pickling tanks to good advantage when the castings are not very heavy.

One method of cleaning large cores out of heavy castings that has been used in only a very few foundries in the country so far will undoubtedly come into more extensive use in the future. This is the hydraulic method, in which the cores are washed out by a jet of water under from 200 to 300 lb. pressure. For this purpose a room should be provided with a concrete floor and concrete tanks for trapping the sand and removing it from the water before the water is allowed to pass to the sewer. The method, however, is so efficient that it will undoubtedly be used more extensively in the future.

Clay floors are used in some heavy work cleaning rooms where very large castings are cleaned and give good satisfaction for this purpose.

Foundry Yard Floors

Before leaving the subject of foundry floors it is well to consider the outside foundry floors, which include the surface of the pig iron storage yard, the flask storage yard and the coke storage.

Coke can be stored either under cover or in the open, but in either case should be placed upon such a surface as to enable the workman to shovel from the edge of the bottom of the pile with ease. In removing a pile of coke it should always be attacked from the bottom and for the floors in coke bins concrete or paving brick make excellent surfaces. Concrete is generally cheaper and gives very good satisfaction.

Altogether too many foundries fail to realize the importance of providing some pavement or surface in a pig iron yard. In foundries in the Central States the writer has seen pig iron dug from 12 to 18 in. below the surface of the rich prairie soil. This had been piled on the hard, dry surface of the soil in the summer, but

when the spring rains came the pile started out of sight. Of course the lower portion of the pile which was in the mud was unavailable during the wet weather, and equally unavailable during the cold weather, for then it was frozen down. A pig iron yard should be so designed as to minimize the handling between the cars and the cupola and still to permit the piling of each grade separately. For ordinary work an excellent floor for a pig iron yard is an ordinary macadam road surface; in other words, a surface of coarse crushed or broken stone rolled hard and finished with a finer surface of the same material. Sometimes a small amount of cement is used in laying this, thus forming a rough cement floor. In countries where limestone, trap rock or similar good macadam material is available this makes an excellent and cheap pig iron yard surface.

In some cases wooden block floors have been installed for this purpose to good advantage, but the blocks should be treated with some preservative solution. In other cases paving brick are used. Where the pig iron is unloaded by the electric magnet and is dropped on to the floor the surface will have to be protected by a layer of rough planking. For this purpose a wooden block floor is fairly good, or a macadam floor over which rough scrap planking has been laid.

Hard rolled cinders or cupola slag and cinders or blast furnace slag makes a very good macadam surface for the pig iron yard. Whatever the surface upon which the pig iron rests, provision should be made between the piles and in the main runways for handling material to the cupola with the least manual labor. If wheelbarrows are employed narrow plank runways are very good. If flat wheeled trucks are used brick pavements give excellent results, but generally narrow gauge railroad tracks are used for this purpose, and in some cases a combination wheel is used on the cars, so that in the yard it runs on a narrow gauge track and on the charging floor on a broad, flat tread on the flange of the wheel.

By carefully laying out the pig iron storage yard it is possible to so simplify the handling of metal to the cupola as to make a saving of several cents per ton in the cost of iron at the spout.

The flask yard rarely receives the attention it should, and the amount of time spent hunting for flasks required or digging them out of the mud or frozen ground totals an amazing sum in some large plants. Where possible all flasks should be stored under cover, and in this case a good cinder floor or macadam floor is generally plenty good enough. For storing light flasks in a yard there should be at least a cinder floor, and it is preferable to have racks of timbers or railroad iron raised above the floor several inches and supported on brick masonry or concrete piers. The flasks and bottom boards are then piled on these racks, which keep them up out of the mud and wet and prevent their being frozen down in the winter or rotted out in the summer.

Large flasks should under all circumstances be placed on some form of foundation. If possible provision should be made for handling the heaviest flasks with a locomotive crane or other handling device, and they should be placed upon cinders, macadam, or, better still, upon raised rails, as described for the light and medium weight flask.

One thing which must be considered is the disposal of the surface water. If a relatively impervious pavement like concrete is employed provision must be made for the run off through suitable gutters of channels, as all of the water will have to pass away in this manner. Gutters must be provided for heavy rains in the summer. Cinders, slag and macadam surfaces have the advantage that they will take a considerable portion of the moisture through the pavement and dispose of it through under drains. When laying such a pavement suitable under drains of tile should be carried along with the work and connected with the sewers.

Molding sand should always be stored under shelter and preferably upon a concrete floor. Experience has proved that in shoveling molding sand the pile should be attacked from the top; hence the surface on which the sand is piled has little to do with the shoveling operation and comparatively little work comes upon it. A pile of coke or coal should always be attacked from the bottom, as already stated, and hence the pavement or floor must have a true surface upon which to shovel.

MISCELLANEOUS FLOORS

There is one feature of manufacturing floors which must yet be considered, and that is the floors for stairs and landings. With modern fireproof construction concrete steps or treads have often been introduced. Where the men pass up and down over these only once or twice a day for each man, they give excellent results and a fair degree of wear. If a hard, gritty material capable of resisting wear, such as blue limestone or trap rock, is used in making the top surface of the steps, they are not liable to wear slippery and will have a very long life.

Where iron plates are used, if of cast iron the surface should always be corrugated; it is better, however, to make provision for attaching a narrow strip of some of the patent devices for resisting slipping along the front edge of the step. These consist of alternate strips of steel and lead or other similar combinations. For ordinary workshops and factories the surface of the stair should be solid, but for stairs leading to charging platforms in foundries, stairs to the open hearth furnaces, &c., the open grate flooring made of wrought iron bars set on edge will give excellent results, and all of the dirt falls through. Generally there is nothing under these stairs to be injured by this dirt, which is not the case with the stairs in an ordinary manufacturing plant. If the same man has to pass up and down stairs continually a relatively soft surface, such as a maple top, should be used or the stairs should be covered with sheet lead or rubber.

Laboratory and Office Floors

The two departments not thus far treated are the chemical and physical laboratory and the office. The laboratory presents a number of floor problems. The analytical room, where acids are constantly in use, is preferably floored with asphalt. Water is constantly being slopped on such a floor and hence wood is not suitable, though it is frequently employed. For sampling rooms, crusher rooms, furnace rooms and similar departments paving brick makes the best floor. For a surface on which to sample large masses of ore, &c., a hard concrete floor is suitable for most material. If, however, the material being sampled contains valuable constituents, like gold or silver, the sampling should be done on a large steel plate.

In some cases the analytical room or a chemical laboratory is provided with a tile floor. Where this is done a tile should be selected that will not wear smooth and slippery. The office and balance room of a laboratory may be provided with a wooden top floor with asphalt or concrete.

In the office it is frequently the case that for reasons of design in connection with the interior trim, a wooden floor and generally one of maple is preferred. Clerks and office help have to stand a great deal, and for this reason concrete is not a suitable material for office or drawing room floors. Asphalt surfaces have been used with good results. There is one curious office floor in this country, which was designed and put in use 40 odd years ago. This is composed of cast iron plates about 18 x 24 in., mounted in masonry. The plates are so designed with grooves and flat topped projections that only about 30 per cent. of the surface is exposed to carry the weight, and this greatly reduces the area which is capable of conducting heat away from the body. Strange as it may seem, those who have worked on this floor for years state that they have never felt that it was particularly cold to the feet, that it made their feet sore, or gave them any trouble whatever. The floor is so located that it is kept at room temperature, and this seems to indicate that the objection to hard floor surfaces is not so much to the hardness as to the fact that it can abstract heat. When the surface is warm and dry, whether it is of iron or concrete, it will not injure the health. We presume, however, that hard maple floors or hard pine floors will continue to be the favored ones for offices

and drawing rooms for many years to come. Where fire resisting qualities have to be considered and a soft floor is still desired, the asphalt top on a concrete slab will give excellent satisfaction.

(*Concluded.*)

A Large High Speed Flywheel

Since the introduction of motor driven rolling mills, which in almost every case require high speed flywheels, the Mesta Machine Company, Pittsburgh, Pa., has specialized along this line. The plant is very well equipped for handling this class of work on account of the very large capacity of its air furnaces for producing special mixtures of iron, as well as the open hearth department, in which carbon and alloy steel castings weighing as high as 100,000 lb. can be produced. Recently additional equipment has been added in the machine department which makes the only limit on this class of work the carrying capacity of the railroad handling the finished product. One of the shipments recently made was a 17-ft. wheel to the Cambria Steel Company, Johnstown, Pa., and Figs. 1 and 2 show end and three-quarter views, respectively.

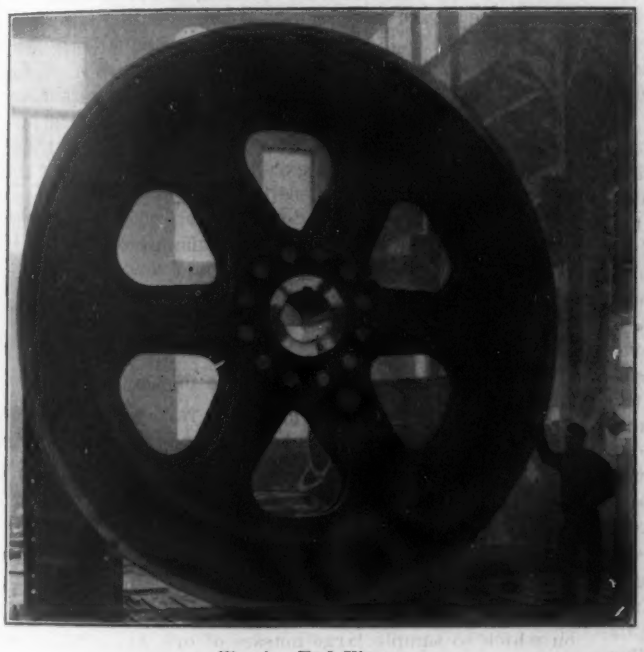


Fig. 1.—End View.

Fig. 2.—Three-Quarter View.

Two Views of a High Speed Flywheel 17 Ft. in Diameter Made by the Mesta Machine Company, Pittsburgh, Pa.

The wheel was especially designed for high speed service and the hub was made of acid open hearth steel. The metal used in the construction of its other parts was a special mixture of air furnace melted iron possessing a very high tensile strength. The wheel arms were each bolted to the hub separately to avoid all strains that might occur if a single casting of this size was used. The face width of the wheel is 24 in. and the bore 18½ in. Its weight is 135,000 lb. The wheel was made in halves and the division was made in the vertical plane. Although this split type of construction was employed the wheel had to be shipped in one finished piece on account of its size, which also made it necessary to secure a special car and have it given a special routing.

New Railroad Equipment Orders.—The Pittsburgh & Shawmut car order amounts to 2115, of which the American Car & Foundry Company will build 1565 and the Pressed Steel Car Company 550. The Central of Georgia is reported to have ordered 250 car frames from the Standard Steel Car Company. The Wabash-Pittsburgh Terminal is expected to place an order for 1000 70-ton steel hopper coal cars. The Pennsylvania will build at Altoona 1000 gondola cars and 66 passenger, dining and postal cars. The Atlanta & West Point has placed 100 flat cars and the Great Northern 75 tank cars. The Wheeling & Lake Erie is in the market for 500 flat cars. The inquiry of the Buffalo, Rochester & Pittsburgh for 1500 to 2000 freight cars is withdrawn. Among recent locomotive orders are 4 for the Wheeling & Lake Erie, 5 for the Florida East Coast, 10 for the Hocking Valley and 10 for the Kanawha & Michigan.

Handling Iron Ore with Electromagnets

At the Moose Mountain mine in Ontario, Canada, says the *Electrical World*, magnetic iron ore of a high grade is picked from the ground by electromagnets and loaded into cars for the crushers. The ferrous material occurs in the side of a hill, and is loosened and broken up into 500-lb. masses by blasting. It then rolls down to the base of the hill, where an electromagnet, mounted on a crane, is used to pick it up and load it into mine cars, at the same time effecting a rough separation, since the rock and other nonmagnetic material are left behind. The electromagnet used has a capacity for handling 1200 lb. of pig iron at a load, but such is the magnetic quality of the unrefined ore that 800 lb. can be picked up easily in spite of its unpromising character. This 800-lb. figure was obtained as the average of a number of loads, in some instances the individual lift exceeding this amount by several hundred pounds. A steam shovel was formerly used for loading the ore, but the density and hardness of the magnetite rapidly destroyed the buckets, so that other means had to be resorted to. The installation of the electromagnets also saves handling a quantity of stone which is broken up along with the ore in its native bed, and thus relieves the crushing and magnetic separating plant, to which the material is afterward taken for concentrating before being shipped to its destination.

The David Lupton's Sons Company, Philadelphia, Pa., has opened an office in the People's Gas Building, Chicago, for the sale of Lupton steel sash, Lupton rolled steel skylight, Pond continuous sash and Pond operating device. R. A. Sanborn has resigned his position as division engineer of the Board of Supervising Engineers of Chicago, to take the position of Chicago manager for this company. His education and wide experience in all types of building construction make him well fitted to carry out the company's policy of advising architects, engineers and owners on the construction required to secure the best results with the Lupton products in light and ventilation for their new factory buildings.

The No. 1½ Newton Duplex Miller

A New Design for General Work Employing Large Diameter Face Cutters

A new type of duplex milling machine has been placed on the market by the Newton Machine Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa. The machine is intended for general work, with face cutters having a maximum diameter of 12 in., or as a slabbing machine. The operating and driving sides of the tool which is known as the builder's No. 1½ duplex milling machine are shown in Figs. 1 and 2, respectively, while the three line drawings give some of the details of the various mechanisms. Figs. 3 and 4 are a sectional plan view and a sectional elevation respectively of the head, and Fig. 5 illustrates the elevating mechanism of the head.

The spindles are ground and revolve in bronze bushed capped bearings 19½ in. long. Worm wheels 13¾ in. in diameter, having bronze rims with teeth of steep lead, drive them and the case hardened driving worms are fitted with roller thrust bearings, both being incased for continual lubrication. Bushings mounted on the vertical driving shafts revolve with them and prevent the escape of oil from the bearings, thus overcoming a serious objection to designs where the splined shafts revolve in the bearings. The construction of the spindle saddles which are counterweighted and have square locked bearings on the uprights is very heavy. A taper shoe is employed for making adjustments, and the bearing which controls the horizontal alignment of the spindle is on the inside shear of each upright only. In this way the for-

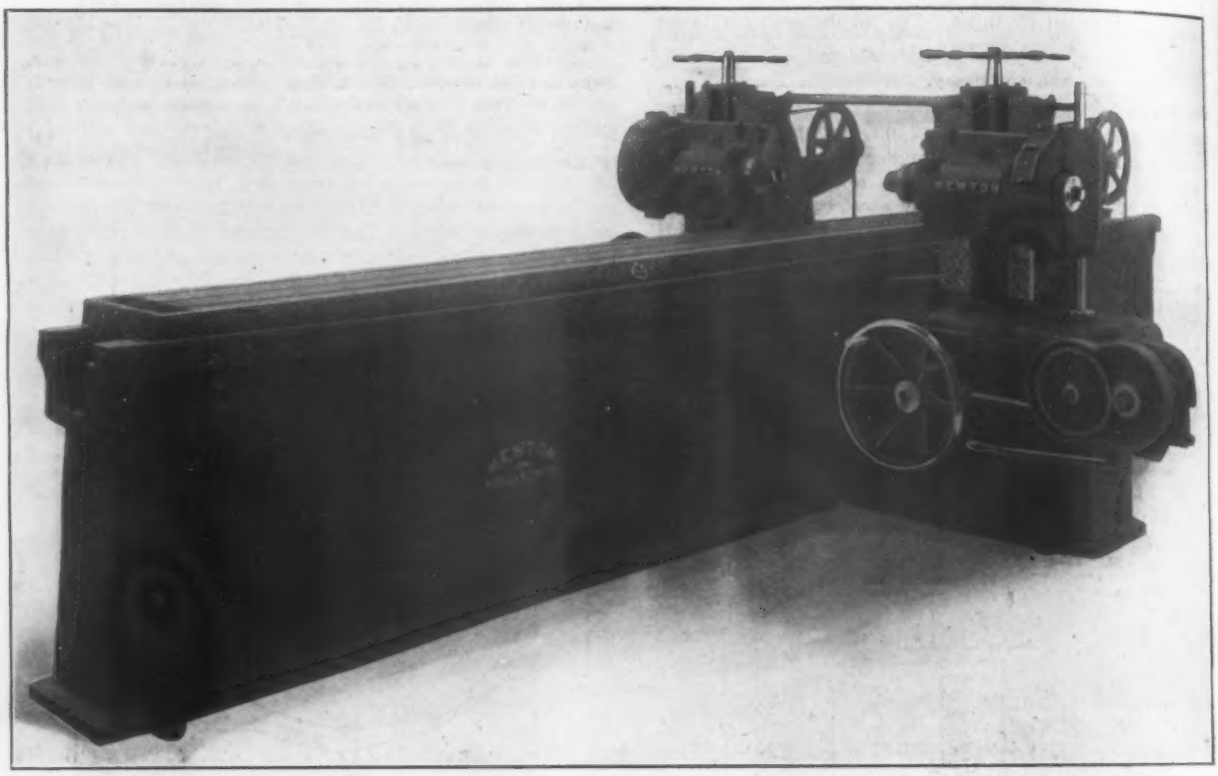


Fig. 1.—Operating Side.

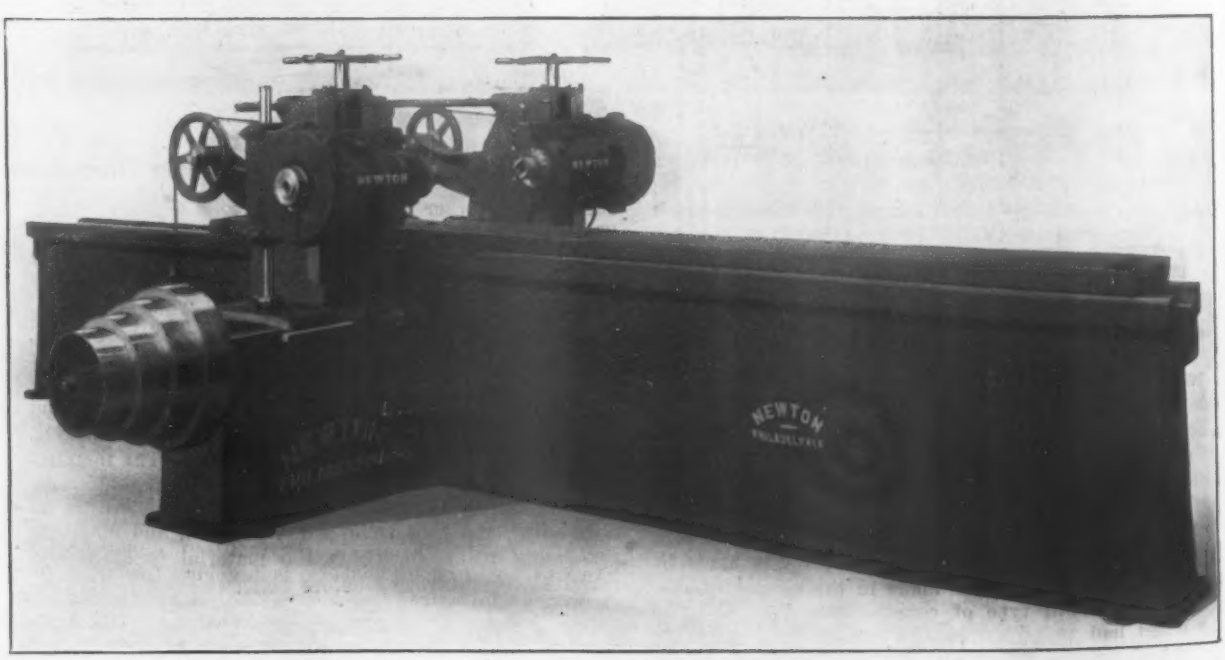


Fig. 2.—Driving Side.

Two Views of the No. 1½ Duplex Miller Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

mer objection of distorting the front faces of the upright when the bearing is on the outside of the shear is overcome. The spindle is threaded externally to receive face milling cutters, while in addition it has an internal taper so that the machine can be used for slabbing by placing a mandrel between the spindles. The cutter arbors are driven by a broad face key, and are held in place by through retaining bolts.

Top and bottom bearings enable the elevating screws to be maintained in tension at all times, and the movement is controlled by hand. The adjustment of the uprights to the wings is secured by taper shoes, and a

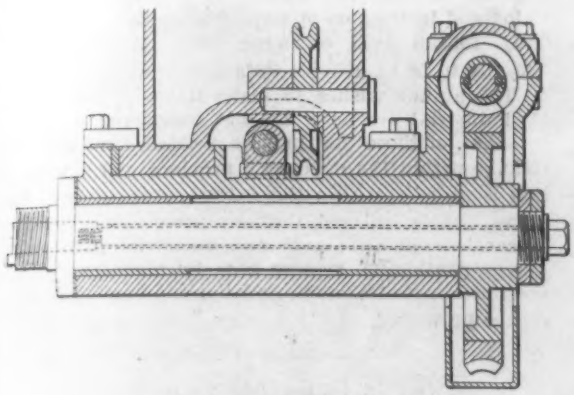


Fig. 3.—Sectional Plan View.

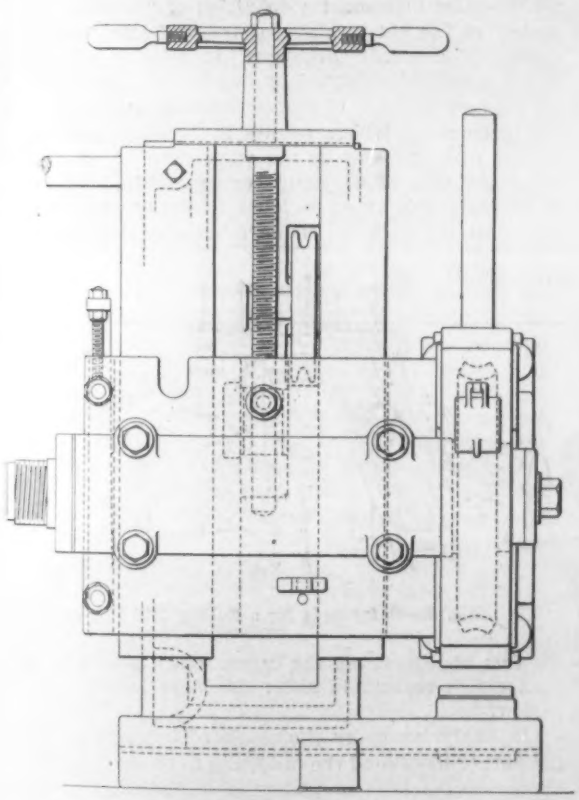


Fig. 4.—Sectional Elevation.

Constructional Details of the Heads.

hand in and out adjustment is provided. The work table has square locked gibbed bearings on the base with T-slots cut from the solid. The drive is by an angular rack and bronze spiral pinion. A variable gear feed and quick power return are provided, the latter being furnished to be reversible or to operate in both directions as desired.

The drive illustrated in Fig. 2 employs a four-step cone pulley. Power for vertical bronze shafts is taken through miter gears, and the motion is transmitted to the operating side of the machine for the fast traverse and feed, both of which are engaged by a Johnson friction clutch. It will be noticed from this engraving that only two feed gears are in place at one time. This arrangement is employed, as many manufacturers now specify the feed which is to be used on their work. Different combinations of gears provide for any desired feed changes. These gears are easily placed in position, as the studs holding them are fitted with slip washers.

The following table gives the principal dimensions of the machine:

Diameter of spindle, inches	3½
Minimum distance between spindles, inches	3
Maximum distance between spindles, inches	28
Minimum distance between spindle center and top of work table, inches	1
Maximum distance between spindle center and top of work table, inches	12
Length of spindle bearings, inches	19½
Diameter of spindle driving worm wheels, inches	13¾
Maximum diameter of face milling cutters used, inches	12
Width of work table, inches	15
Length of work table, feet	13
Length of work milled, feet	12
Floor space, inches	88½ x 216

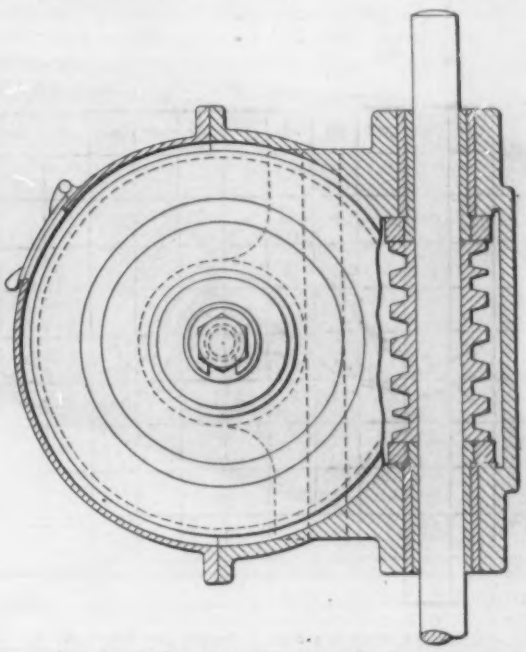


Fig. 5.—Detail of the Elevating Mechanism.

All the bearings are bushed where necessary, and hand adjustment for the work table is provided.

Workingmen's Compensation in Ohio

In the Ohio Legislature at Columbus last week, the Workingmen's Compensation bill, providing for the payment of injured employees from a State insurance fund, to which both employers and employees are to contribute, was sent to the House in the form of a majority report of the special commission which has been at work in the past year. The minority of the commission will present a bill endorsed by the Ohio Federation of Labor, which provides that an employee may sue for damages, if he desires. The judgment, if any, may be recovered by the employer from the insurance fund.

The majority bill takes away from the employee the right to sue, since it provides compensation without regard to negligence. A "State Board of Compensation Awards," with five members, is provided for, with full power to investigate accidents and make awards. A State liability actuary is also provided for. His duties are to classify industries with respect to their hazard and determine the risks of the different classes and fix the rates of premiums accordingly. The rates are to be based on the total payroll and number of employees in each of the classes of employments, and are to be sufficiently large to pay each employer's proportion of the compensations and to create a surplus to guarantee the solvency of the insurance fund.

The Pawling & Harnischfeger Company, Milwaukee, Wis., builder of cranes, hoists, &c., has opened a branch office at 533 Baronne street, New Orleans, La., under the management of T. W. Waddell.

The Mechanical Engineer and Prevention of Accidents*

What He Can Do as a Designer and Executive to Reduce the Number of Injuries

BY JOHN CALDER, ILION, N. Y.†

The subject of accident prevention is now coming to the front on that wave of humanitarian consideration which is noticeable everywhere. On its educational and sentimental aspects the public and press of the East have had their interest awakened to some extent by the efforts of the American Museum of Safety Devices, the National Association of Manufacturers, the National Civic Federation and others. On the strictly practical

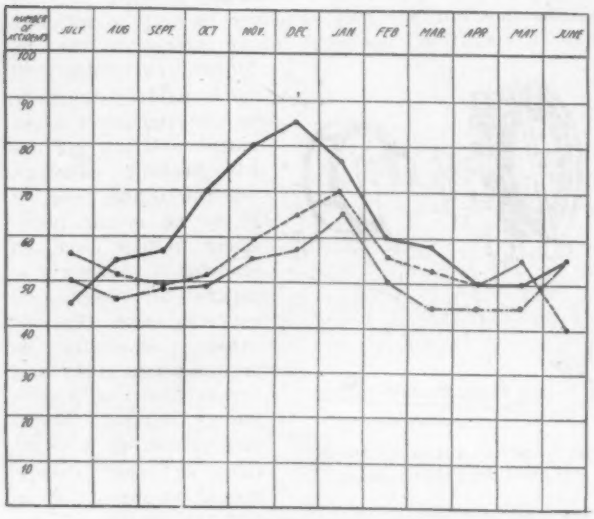


Fig. 1.—Chart Showing the Influence of Daylight Upon the Number of Fatal Accidents.

side the broad based safeguarding work initiated in all its plants at a large outlay by the United States Steel Corporation has received deserved publicity. At the same time the successful operation of thorough preventive measures has been going on unnoticed for years at some relatively few individual works, but these have formed quite a minority among the many plants in-

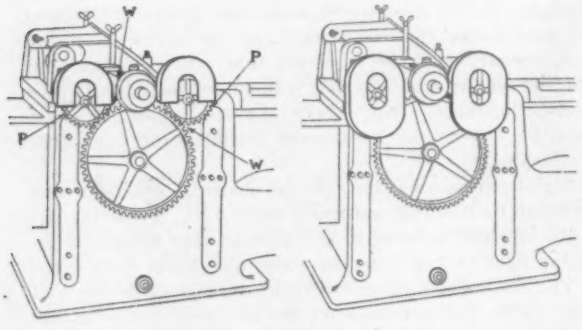


Fig. 2.—Examples of Improper and Proper Gear Guards.

curring accident risks which were imperfectly safeguarded.

The Mechanical Engineer and Accidents

The principles of safeguarding and safeworking in industry should be as much a part of the economic education of the young engineer as those of efficiency and conservation in other directions. The scientific study as a matter of course and the solution by the mechanical engineer of individual problems of safeguarding, supervision and instruction of employees as they arise in their daily routine will do more than all other existing agencies to bring about satisfactory results.

The author wishes to make it clear, however, that all industrial accidents are not considered preventable, and that, of those that may be avoided, some do not fall strictly within the engineer's province and a large portion is directly within the control of the injured themselves. It is believed that, by proper supervision and precautions in all plants and industrial processes and the cultivation of greater care by operatives, at least one-third of the present annual sacrifice of life and limb can be prevented.

The Causes of Accidents

In illustrating in the present paper what the mechanical engineer may achieve in this department of the conservation movement a definition of "accident" and a review of the chief causes of industrial injuries are in order. The word "accident" in relation to industry is not specifically defined by any statute, but it has the popular significance of any unforeseen and usually sudden occurrence which results in bodily injury to any person while present at the work place or even within the boundaries of the employer's premises. The injury, to be reportable as an accident, need not arise out of or in connection with the employee's assigned duties. It is

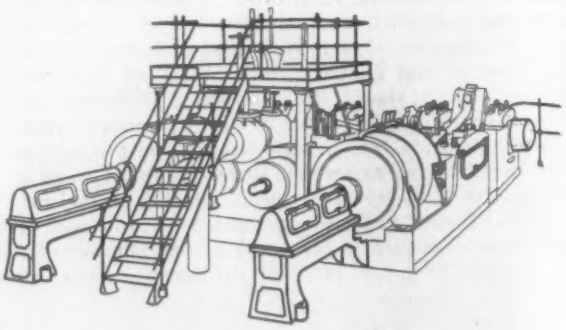


Fig. 3.—Safeguards for a Rolling Mill Engine.

the fact of injury, not the cause, which generally makes an accident reportable under the labor laws to the civil authorities.

In analyzing many thousands of industrial accidents the author has found the following to be the chief causes: Ignorance, carelessness, unsuitable clothing, insufficient lighting, dirty and obstructed workplaces, defects of machinery and structures, and absence of safeguards. In current popular comment on the wastefulness of life and limb in our industrial régime little regard is paid to the facts underlying accident, but well considered action must be based solely on these of which some account follows:

In spite of ample facilities now afforded to all for the acquisition of some knowledge of mechanical principles, the author has found some superintendents, a number of foremen, many operatives and not a few managing owners of smaller plants grossly ignorant of the nature of the forces and mechanical arrangement which it is in their power either to control or to set free with resulting danger to themselves and others.

Sometimes combined with ignorance, sometimes sheer thoughtlessness, folly or horse play, carelessness by operatives stands highest as a cause of industrial accident

* From a paper presented before the American Society of Mechanical Engineers, in New York City, February 14, 1911.
† Manager Remington Typewriter Works.

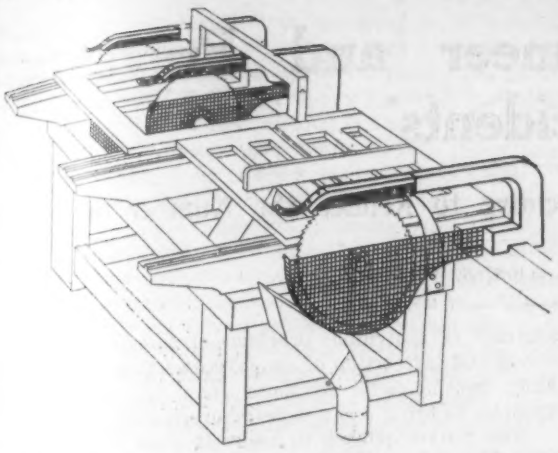


Fig. 4.—A Guarded Triple Saw Side Feed Bench with Clear Tables.

from the results of which nothing external can do much to shield the worker and those whom he sometimes involves. It is the experience of the author that the American workman is easily first in taking foolish and wholly unnecessary chances with his life and limbs; chances which in no way add to his efficiency or his earnings. The maintenance of strict discipline in the shops, the adoption of salutary punitive measures and the firm elimination of the dangerous employee is all that can be done, in addition to a campaign of education throughout the plant.

Accident is caused at many machine parts which are necessarily exposed near the operator, and with which he would never come into dangerous contact but for unsuitable or neglected clothing. The ragged sleeve ends, loose ties and open jackets of untidy machinists have again and again been wound upon seemingly trivial parts in motion and through the powerful effect of coil friction have inflicted frightful and often fatal injuries.

Insufficient lighting is a cause of numerous accidents, particularly serious and fatal falls. The author has observed that a maximum of accidents occurs toward the close and beginning of each year, that is during November, December and January, the months of minimum daylight. Fig. 1 shows the seasonal distribution for three successive years of about 700 deaths annually from industrial accidents, which were reported with other injuries from an area embracing 80,000 plants of varying extents. The intensity of artificial lighting at the cutting point of tools, and on very limited machine tool or bench areas is frequently far above actual requirements and a source of much physical discomfort, while all around the operative a semidarkness prevails which has a blinding effect in the sudden transitions of the vision required by his employment. What is wanted is the elimination of this excessive hard light on spots only, which causes eye strain and poor vision of surrounding areas with resulting accident. A more generally diffused light of less unit intensity is now easily obtained by using fewer but larger screened units experimentally located to suit varying shop requirements and reflecting from whitened wall and ceiling surfaces.

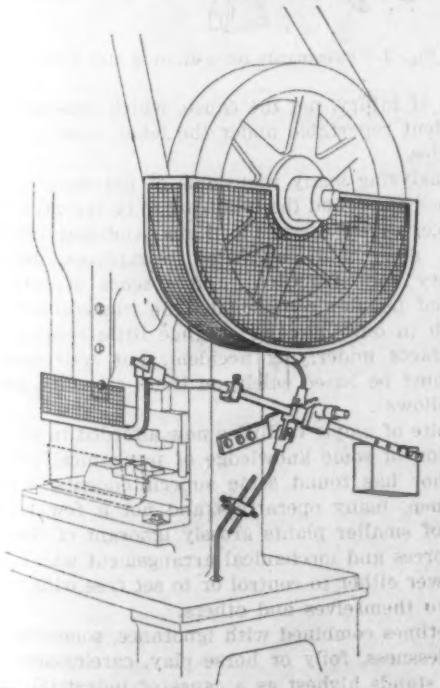


Fig. 5.—An Automatic Screen Guard for Press.

Dirty and obstructed workplaces are closely allied to defective illumination as a source of accident. Workplaces often retain unnecessarily dirty and obstructed environments, and every management should see that the cleaning of floors and passages and the removal of wastes is systematically provided for. Almost all our mechanical operations can be conducted under pleasanter and safer conditions than at present, so far at least as light and cleanliness are concerned.

Defects in machinery and structures used contribute to some serious and a number of minor casualties, but to nothing like the extent commonly alleged. It certainly does not pay any employer to keep a defective tool in operation; nor is it in the interest of the employee, particularly if he is paid by the task, to use imperfect apparatus, which reduces his possible earnings. On the other hand, it is by no means infrequent to find workmen showing a striking disregard for their own safety and that of others, especially in framing structures and arrangements of a temporary nature. Workmen persisting in practices of this nature should be eliminated as unfit and dangerous employees and the ability of any untried operative to construct safe facilities to be used by himself and others should never be taken on trust.

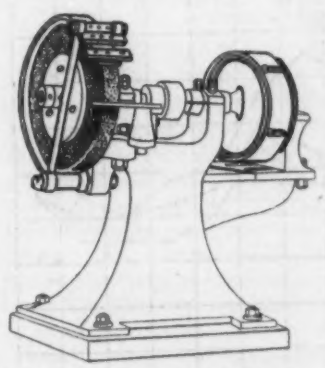


Fig. 6.—Safety Adjustable Hoods for Disk and Face Grinders.

The Possibilities of Safeguarding

The absence of safeguards closely concerns the mechanical engineer, who holds the possibilities largely in his own hands. In many cases of injuries to operatives caused by the absence of a possible safeguard, it will be found that it has been removed, or rendered ineffective by the employee for lack of supervision in such matters or that protection has never been provided. Safeguarding absent at one machine is sometimes actually afforded elsewhere under the same roof and the accident is due to the operation of the principle that what is permitted to be everybody's or anybody's business is in daily life nobody's business. The safety engineering of no plant should be left to the haphazard initiative of a number of individuals.

Consideration of what the mechanical engineer can contribute to this end naturally falls into two divisions: (*a*) the efficient safeguarding which he may design as an integral part of the machine tools and other apparatus and (*b*) the safeguarding which he may later devise and supply as the mechanical engineer or executive of plants using power apparatus and other equipment capable of inflicting injury.

The Machine Builder and Safeguards

The machine tool builders have already accomplished a great deal of most useful safeguarding, particularly in protecting the workman from the dangers of toothed gears in metal working and other tools. Now and again a guard is encountered which is simply a snare and which shows conclusively that its designer had appearance rather than utility in mind. The machine at the left of Fig. 2 illustrates this, the pinions P, P, being securely covered on the top, which is the outrunning and safe side, by semicircular flanged hoods, whereas the intaking and dangerous parts of the gears W, W, are

unprotected and have gripped the clothes and limbs of unsuspecting operatives. The covering of the outrunning sides of gears is often desirable to prevent the lodging of chips and waste in them, but they are usually harmless when exposed. The view at the right shows the proper gear protection for the machine illustrated.

In this paper the illustrations are limited to examples of safeguarding from only a few out of the many manufacturing industries concerned, but the principles outlined and the methods shown are applicable with occasional modifications wherever power driven machinery is operated.

Guarding of Equipment Built Into Position

Under this head are embraced all power generators, and a very large class of machines and industrial apparatus whose accident risks at dangerous parts depend upon the environment, the manner of installation and the precise nature of the workmen's duty around them. Protection against accident at such apparatus is not secured by merely guarding the dangerous moving parts. All stationary portions of such structures as may cause injury to attendants and others should be equally included. A double metal railing not less than 3 ft. high and not nearer any moving part than 12 in. should be provided at all dangerous places, and at both edges of all stairs and elevated platforms. The fulfillment of these requirements is shown in Fig. 3 on the starting platform, tail rods and cross heads of a rolling mill engine.

Guarding of Transmission Machinery

The extensive use of motor drives has done away with many transmission belts, shafts, pulleys, collars and couplings in dangerous proximity to employees in all of our more modern plants. The managers and mechanical engineers of many industries have still to reckon daily with the accident risks of the older type of buildings and transmission arrangements, and the latter ought to be closely scrutinized in every detail. Seven feet clear of every moving part is considered the least hight from the floor level without guarding and, even then, where a horizontal belt drives across a frequented passage at this minimum elevation it is well to have the lower side screened close to the belt to avoid injuries caused by "whipping" when the belt breaks.

The use of the belt perch prevents the traveling of the belt when unshipped, and accident therefrom; obviates its unnecessary wear and its possible destruction when falling into the narrow gap between a pulley and a bearing. Special care should be taken by the designers to see that all belt shifting and machine starting and stopping gears are positive in their action. Many accidents have occurred at machines through inefficient or defective fast and loose pulley and belt arrangements suddenly starting a tool which was under examination or adjustment.

Especially Dangerous Machines

The most difficult safeguarding problems for the engineer are those relating to numerous machines used in the arts, which are essentially dangerous at the operating point. No machine is effectively protected by any guard which hampers a workman, reduces his speed and earnings and has not been designed for the actual working conditions. Such inadequate apparatus is naturally removed by the workman or wholly or partially put out of action at the first opportunity and the particular safeguarding problem becomes the subject of a fruitless triangular controversy between the employer, the employee and the factory inspector. To educate the employee to use caution and foresight about dangerous machines is difficult enough, and it should not be rendered more so by calling upon him to work with an impracticable safeguard. What is needed in such a case is careful inquiry, by a competent engineer experienced in the study of safeguarding problems, into the conditions under which the employee has to operate and a solution, where such is possible, which will enable him to work with efficiency and safety, or at least to reduce considerably the accident risk of his occupation.

For illustrating the problem of the especially dangerous machine, the author has confined himself to examples of accident experiences with only four out of many classes of such apparatus. These four, however, are probably the most prolific in accident to the operator when performing his usual duties. They comprise woodworking saws and cutters, punches and presses, rolling machinery of all kinds where hand feeding is necessary, and emery and other grinding wheels.

A close approach by the fingers of workmen to sharp cutting tools running at a very high rate of speed is essential in operating efficiently many woodworking saws and cutters. Consider first the common circular saw. In spite of claims to the contrary a universal saw guard does not exist on the market. On the other hand, except in the case of small diameter checking and grooving saws covered by the work, the author believes it is quite possible to safeguard all saws to varying degrees conditioned by the uses to which they are put.

Fig. 4 shows in some detail the solution of a circular saw protection problem, where the conditions were supposed by workmen and foremen alike to forbid safeguarding, which would permit the machines to be worked at full efficiency. The saw bench illustrated is a combination trimmer and edger, having three saws on one shaft. The overhung saws, a rip and a crosscut, respectively, are fixed in position on the shaft ends, but the middle cross cutting saw must, with any guard, traverse the shaft freely when required for a distance of 18 in. The work handled varies from one to three thicknesses, totaling 2 in., and is fed into the saws on two sliding tables of 29-in. stroke and of fixed and variable gage, respectively. Thus no attachment above the bench for any guard is possible at the front or sides or for about the above distance to the rear of the saw. As finally worked out, the rip saw has a safety parting knife fitted in its rear, and all three saws are efficiently and strongly guarded at every dangerous point. The saw line is always visible through the mesh work and pierced work, yet the operators' hands, which necessarily travel with the work, can never approach the saw teeth too closely, as they are pushed off by the projecting fingers.

The common jointer accounts for a large number of finger and hand amputations every year. In two types of guard, two movements, vertical and horizontal, respectively, are necessary to adapt it to any given piece of work. In a third the guard supported on springs rises automatically when pushed by the work and only the transverse sliding motion is necessary for positioning. After the work has passed the guard the latter returns automatically to a position close to the cutter gap. In the other two types the guards maintain their hight above the table until readjusted. All these guards can be readily swung out of the way for cutter adjustments and as easily returned for use.

The vertical spindle molding cutters can also inflict serious injuries. Sometimes a leather knuckle duster revolves with the tool and contact with it warns the workman of too close approach.

Punch and press machinery probably ranks next to woodworking tools in frequency of accident, though usually the operative escapes with less serious injury. The mechanical engineer cannot be too careful in seeing that these tools are in good repair, particularly the actuating gears. Automatic roll feeds, subpresses, magazine, hopper, gravity slides and push slides feeds have done a good deal to eliminate the dangers of feeding such presses by hand, but much work already blanked must still be handled in this way in subsequent punching and pressing operations.

The increasing use of compressed air in mechanical industries permits of light pieces being blown off the die at the end of the operation by a cam operated blast properly directed and timed, while the ordinary spring ejector serves the same purpose for heavier work. Yet there are many punches and presses running to-day without efficient safeguards, and even where they are to be found the principles are not carried out consistently at all necessary places. Fig. 5 shows screen press guard which is timed to descend upon the operators' fingers, if in a position of danger, and secure their withdrawal before an accident occurs.

The third class of special apparatus essentially dangerous at the operating point is hand fed rolling ma-

chinery of every description. At powerful hand fed pressing and calendering rolls the injuries are usually very severe.

In the case of a single pair of large rolls it is possible by having the feed table level with the top of the lower roll and placing a bar, plate or screen across the bottom of the upper roll, to guard effectively the dangerous intake by arresting the operative's hand when accidentally traveling toward it on the work. The chance of accident from hand fed vertical rolls is considerably reduced when a feeding table is used, which keeps the operator at a safe minimum distance from the roll intake and necessitates a conscious effort to reach it. When rolls are operating on plastic materials, easy access for cleaning and scraping the rolls is essential and a suitably placed rod attached to the top roll housing and rising and falling with it takes the place of plate and mesh guards.

In laundry and cloth finishing machinery such forms of protection are not practicable on the rolls, owing to the nature of the work. To meet such cases a light, smooth auxiliary hardwood roll is substituted as a guard. It is pressed constantly against the main rolls by springs and is driven by them, but it fills the dangerous intake and arrests any part of the hand accidentally traveling toward the latter and in danger of being crushed. In compound power fed rolls with continuous webs of work, multiple floating guard rolls, controlled and released by a system of levers whenever a break in the web necessitates restarting by hand feeding, can be used. A counterbalanced bevel edged board is used, which ordinarily swings up and out of the way. With this the operator can with perfect safety push the cloth or other web home till it is gripped by the rolls.

Emery wheels, grindstones and other abrasive tools when overspeeded or when strained or shocked while in motion within the limits prescribed by the makers sometimes burst with great violence and spread death and serious injury in the path of their flight. Various methods for confining the wheel fragments to the machine casing, or at least rendering their velocity harmless, have been worked out. In all of them ample side clearance between the wheel and its casing is a primary requisite. Fig. 6 shows a form of armoring successfully used to retain fractured wheels on disk and face grinders.

Especially Dangerous Processes

In addition to the wide scope afforded the mechanical engineer for assisting in the conservation of life and limb in the operation of industrial machinery, there are not a few matters calling for his attention and for administrative regulation in various dangerous processes used in the arts. Here also our aim as engineers and humane employers of labor should be primarily prevention.

Conclusion

In concluding this review of the field of industrial safeguarding in its more important manufacturing aspects and with special reference to its close relations to the art of the mechanical engineer, some administrative precautions should be briefly noticed.

Safeguards, where at all possible, should be constructed of metal to secure durability. Reinforced steel mesh work is preferred by the author for all but the heaviest machinery. In steel mills, foundries and heavy work plants of various descriptions, where the wear and tear of equipment is very great nothing but strong castings or steel plate work should be used for the majority of the guards. It is the practice of the author to have all safeguards readily distinguished by painting the body of them vermilion and the reinforced edges black. This allows executives to detect at a glance a displaced or defective guard.

Warning and caution notices should be sparingly used and as brief as possible. They give a possible legal protection from certain kinds of accident damage suits, but they are practically worthless in every sense if no attempt is made to enforce them. The supervisory and educational efforts of fully instructed and sympathetic foremen receiving full credit for the safeworking of their respective departments and a few well considered and enforced regulations prominently displayed in print are, the author believes, far more effective than a long catalogue of work rules which few will read and none will remember.

It has been the practice of the author to give immediate and competent first aid services within the plant to every injured person. The prompt cleaning and dressing of slight accidental wounds gives great relief to the sufferer, and renders any later medical attention more effective. In the majority of cases nothing more is needed, but neglected or delayed treatment of simple injuries may have most serious consequences.

Every works executive and engineer will find it a valuable adjunct to the safety engineering of the plant to maintain in every department, apart from labor law and casualty insurance reports, a full and accurate record of every accident and also of every near accident. Periodical examination of these and the determination of every mechanical engineer to practice safety engineering to the best of his ability, without regard to the legal minimum or compulsion, will help more than anything else to remove speedily a great reproach from our industrial life.

Natural Gas in 1909 and 1910

The production of natural gas in the United States in 1909, as ascertained by a joint canvass made by the United States Geological Survey and the Bureau of the Census, is estimated by B. Hill, in charge of this work, under the supervision of Dr. D. T. Day, to have been of a value of $55,000,000, an increase of only about $359,626 over that of 1908. There were no great changes in the industry during the year, the production continuing to decline in Kansas, and an increase being made in Oklahoma and in the Caddo field in Louisiana and in Texas. An interesting feature was the supplying of Fort Worth and Dallas from the gas fields of Clay County, Texas. For the year 1910 the total production is valued at $57,000,000, an increase of about $2,000,000 over 1909. During 1910 a feature of great interest was the development of what promises to be a very large supply of natural gas in the Buena Vista Hills, Kern County, Cal., east of the Sunset-McKittrick oil field. Arrangements were made and practically completed during the year for piping this gas to Bakersfield and other towns in San Joaquin Valley.

The Quebec Bridge.—The Quebec Bridge engineers have come to a decision as to the plan of structure to recommend and the tender to report in favor of. They have advised the Minister of Railways and Canals accordingly, but nothing will be given out until he announces the decision in the House of Commons. It is rumored that the St. Lawrence Bridge Company is the successful tenderer. This is a corporation formed by the Canadian Bridge Company, Walkerville, Ont., and the Dominion Bridge Company, Montreal, Que., the two cooperating in this particular enterprise.

The Hubbard Steel Foundry Company, East Chicago, Ind., has completed an extension to its main foundry building, 120 x 190 ft., to provide additional molding space, and also to make room for a second furnace and additional core ovens. The company is at present installing a 15-ton acid open hearth furnace, which is being rushed rapidly to completion. There will be two core ovens in the extension built in a block, each approximately 18 x 25 ft. and 13 ft. high, equipped with doors at each end and with tracks running through the center.

The Queen City Punch & Shear Company has moved from its old plant at 208-212 Lawrence street, Cincinnati, Ohio, to Front and Pike streets, taking the building formerly occupied by the Bickford Tool Company. By this change it doubles its space and capacity and will thus be enabled to handle its orders with more speed. The company manufactures punching and shearing machinery and straightening and bending rolls. It goes into its new quarters with some nice orders booked.

Motors for Driving Main Rolls of Mills

Their Advantages Set Forth, with a Description of Typical Arrangements at Various Plants

BY BRENT WILEY.*

One of the most important matters now receiving the consideration of steel manufacturers is the question of reduction of power costs; for, while the cost of power for rolling steel is only a small percentage of the total cost of its manufacture, the aggregate cost of fuel representing a large amount, due to the exceedingly large tonnage of the mills.

There are two efficient methods of reducing power costs:

1. By the installation of gas engines using blast furnace gas, connected to drive electric generators.

2. By the installation of low pressure steam turbines operating an exhaust steam from the mill or other power engines, for driving electric generators.

It is not practical to connect the gas engine or the exhaust turbine direct to the rolling mill, but the best solution is to transmit by means of electricity the cheap power thus obtained. This requires motor drive on the main rolls. In some cases, especially with small plants, the advantages of this form of cheap power for supplying electric drive to the auxiliary apparatus are sufficient to warrant the extra first cost, even to the extent of abandoning the old engine driven power apparatus.

The advantages of electric drive are constant and regular torque, more reliable drive, less breakage of couplings, pinions, &c.; less room required, by reason of absence of boilers, pipes, &c.; easy adaptation of motors to mill; easy distribution of power by means of electric cables, instead of steam or gas pipes; easy and simple control of the power; centralized power generation; less labor; lower fuel costs; less oil and others stores, and the use of gas engines of medium size in the power station. In addition, the output may be increased at times on account of the economical speed variation that can be obtained with motors, where it is desired to finish the light material at a higher speed than the average product. Alternating current motors can be designed with winding for two speeds, and sometimes two units with cascade connections are used to give the required speed changes.

Electric drive for the main rolls of steel mills has also a great many advantages that cannot be capitalized di-

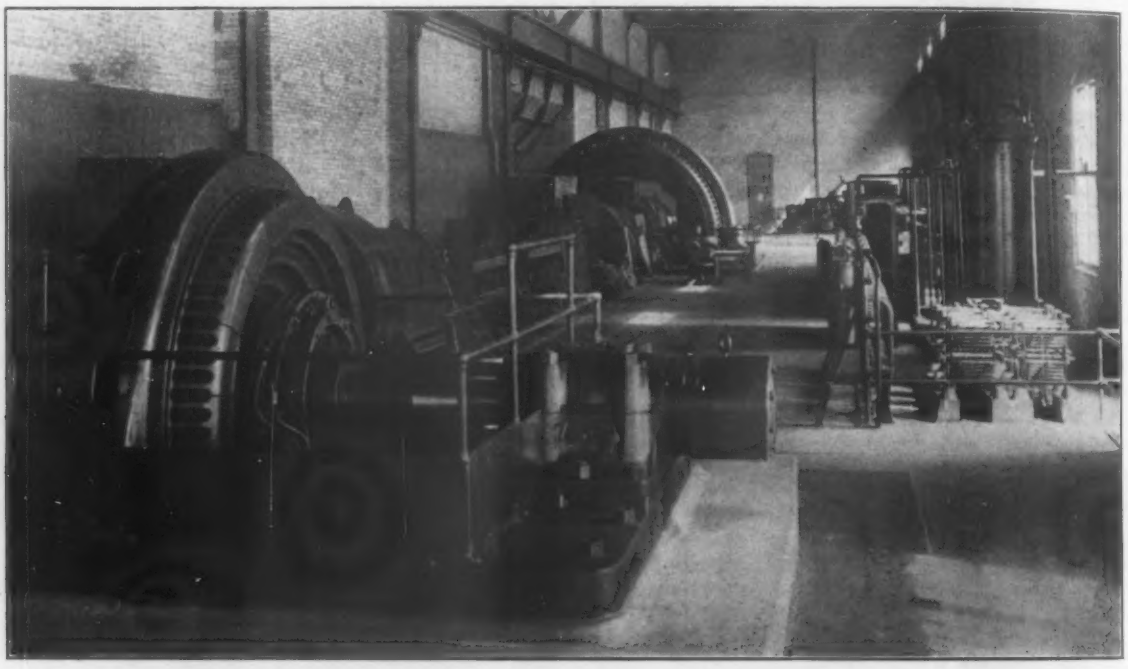


Fig. 1.—3200 Hp. and 650 Hp. Motors Driving Main Rolls of 18-In. Merchant Mill, Shown in Fig. 7.

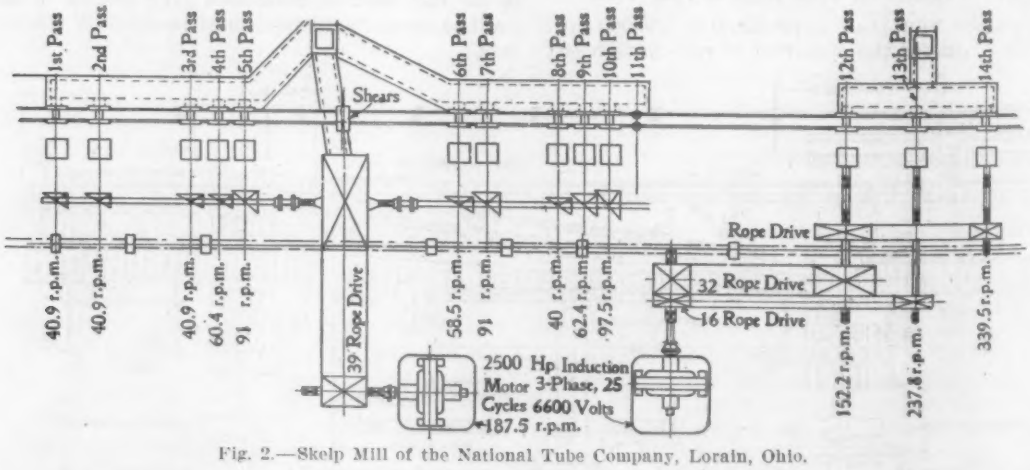


Fig. 2.—Skelp Mill of the National Tube Company, Lorain, Ohio.

* Commercial Engineer of the Westinghouse Electric & Mfg. Company.

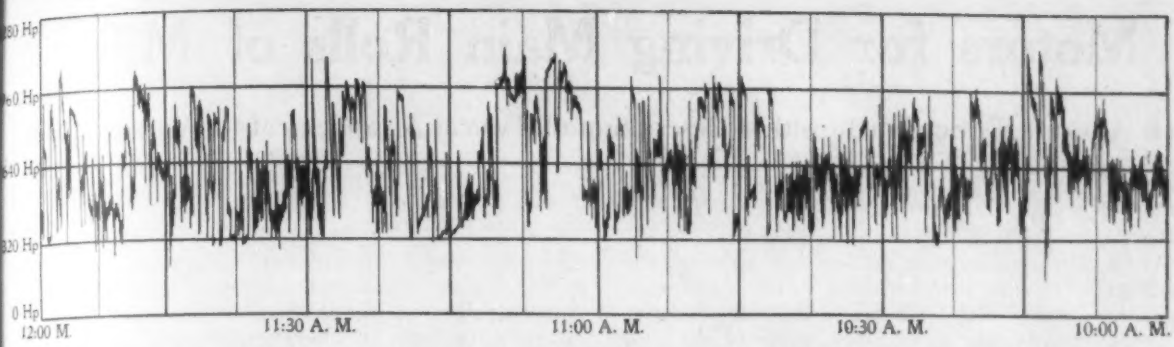


Fig. 3.—Graphic Wattmeter Curve for 1200-Hp. Motor on Rolls of the Sheet Mill of the Seneca Iron & Steel Company, Buffalo, N. Y.

rectly, but which will be very effective in the furthering of this comparatively recent development. One of the principal incidental advantages is the facility afforded for obtaining accurate record of the power required, such as that shown in Fig. 3. The exact operating conditions can be definitely determined at any time by means of indicating and integrating meters. This condition is quite

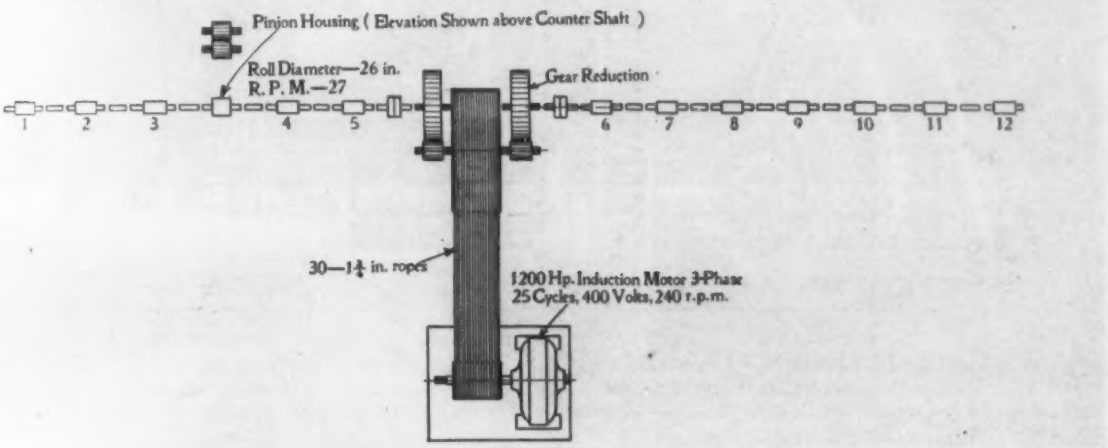

Pinion Housing (Elevation Shown above Counter Shaft)
Roll Diameter—26 in.
R. P. M.—27
Gear Reduction
1 2 3 4 5 6 7 8 9 10 11 12
30—1¼ in. ropes
1200 Hp. Induction Motor 3-Phase
25 Cycles, 400 Volts, 240 r.p.m.

Fig. 4.—Sheet Mill of the Seneca Iron & Steel Company, Buffalo, N. Y. Both top and bottom rolls of No. 3 mill are driven. On other mills the bottom roll only is driven.

in contrast with the problem of power readings for steam engine drive. The many automatic and protective features of the auxiliary motor drives also permit a better arrangement of the mill and more economical operation by reducing the number of operators required.

150,000 Hp. in Motors for Main Rolls in Four Years

During the past four years approximately 150,000 hp. in large motor units for the operation of rolls have been installed in steel mills, including drives for blooming, billet, rail, structural, universal, plate, wire, merchant, rerolling and sheet mills. Test data from these various mills will do much to advance the art of rolling. The power requirements can be studied in detail and the reduction schedule can be worked out for greatest economy of power and time. Power instruments give indication of any disorder in the mills proper, thus enabling the mill foreman to prevent excessive friction loads and excessive wear of parts due to poor alignment, excessive thrust and bearing pressure.

The question of commercial efficiency is the principal item to be considered, and it is quite complicated owing to the fact that as conditions vary greatly in different plants a separate analysis must be made of almost every case.

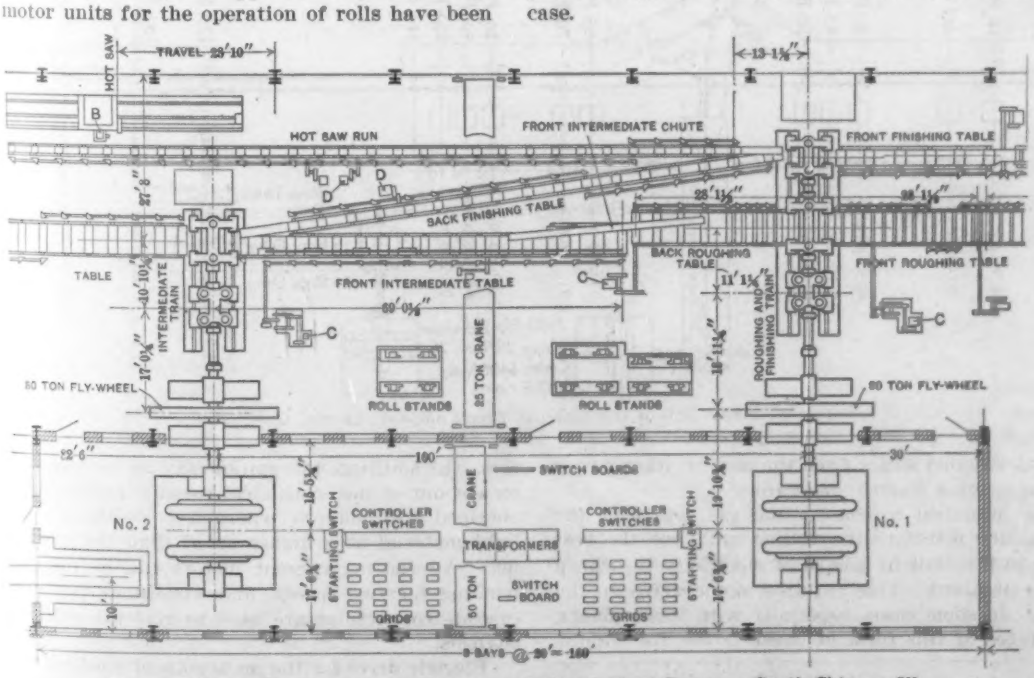


Fig. 5.—Light Rail Mill at South Works of the Illinois Steel Company, South Chicago, Ill.

The United States Steel Corporation and many other steel companies are making a careful study of this particular subject in order to improve the economy of their present works. In many plants it is not practicable to consider the gas engine proposition. The number of furnaces may not be sufficient to insure reliable operation or the plant may not include blast furnaces; or, again, the first cost of the installation may be prohibitive, being very much more expensive than a low pressure steam turbine equipment of equal capacity. On the other hand, by the use of the exhaust steam turbine taking steam from noncondensing engines, an increase of 75 per cent. of the power developed by the engine can be obtained without additonail fuel consumption.

Various Arrangements and Methods of Drive

The several mill plan views shown give an idea of different mill arrangements and methods of drive. In several merchant mill propositions a motor for each stand of rolls has been considered, but in every case it has been found best to reduce the driving units to two, from a standpoint both of first cost and of mill design. It will be noted that in the Indiana Steel Company's merchant mills the second motor is used to drive the finishing pass only. In existing merchant mills, where all of the roll trains are connected together and consequently all are running at the same speed, it will often be found advantageous to install a motor to drive the last set of rolls or perhaps the last two, thus giving an opportunity to speed up these rolls and thereby get the long material out of the mill more quickly. This is especially true in the smaller mills (8 to 10 in.). The Illinois Steel Company tried out this scheme in its Milwaukee 8-in. merchant mill with splendid success, increasing the output several per cent. due to the more nearly continuous operation of the mill.

Direct current motors have been installed in some cases in order to secure the advantage of speed variation. The present tendency is, however, toward the exclusive use of alternating current at voltages of 2200 to 6600 volts, at 25 cycles, three-phase. The lower frequency allows much cheaper construction or large sized slow speed motors, while the higher voltages afford many advantages in the distribution of power in large plants. The motors are of the induction type with phase wound secondaries.

In estimating a motor for this type of work a load diagram of the torque required during a complete cycle of operations is first drawn up, as shown in Fig. 6. Such a load diagram gives the exact nature of the load conditions, including variation of load and the time element, and this information is essential in calculating the proper capacity of the motor and the necessary flywheel effect to be included in the system. The full line in Fig. 6 shows the calculated load diagram for the motor driving the main rolls of the 18-in. merchant mill of the Indiana Steel Company. This motor, as shown in Fig. 7, drives rolls for eight passes. The rolls of the ninth or finishing pass are driven by a smaller motor which develops approximately 660 hp. for 12 seconds in each 20-second period. The diagram shows a maximum requirement of approximately 4500 hp. and a minimum of less than 1000 hp. during each 20-second period. Owing to the flywheel effect, the load on the motor is slightly reduced or equalized, as shown by the dotted line. In this particular case the power required is not subject to extreme variations, and, moreover, the cost of power is low. A comparatively low flywheel effect was, therefore, considered advisable. In case the driving power fluctuates between wide limits in very short periods, a larger flywheel effect is preferable, especially where the cost of power is an important item.

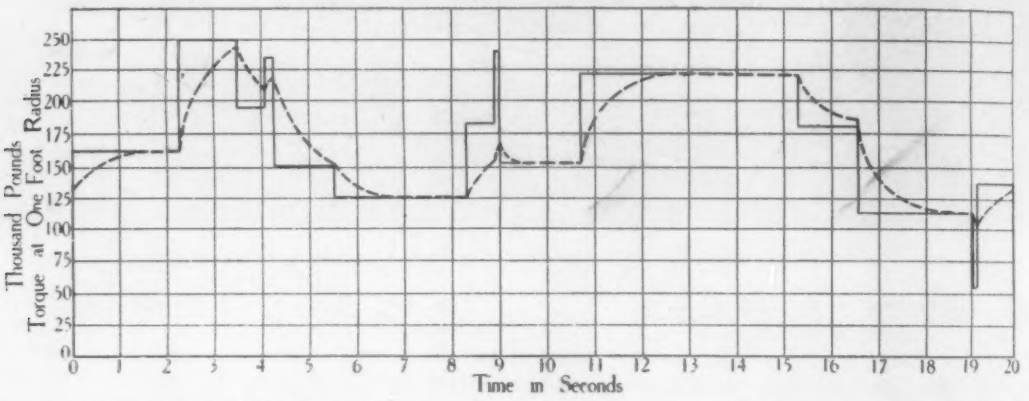


Fig. 6.—Estimated Load Curve for 3200-Hp. Motor.—The diagram represents a cycle of 20 seconds duration and continues by repetition. Full line, load diagram. Dotted line, motor load with flywheel effect of 3,000,000 lb. at 1 ft. radius. Motor speed with 184,000 lb.-ft. torque is 91.5 rev. per min. Slip, 10 per cent.

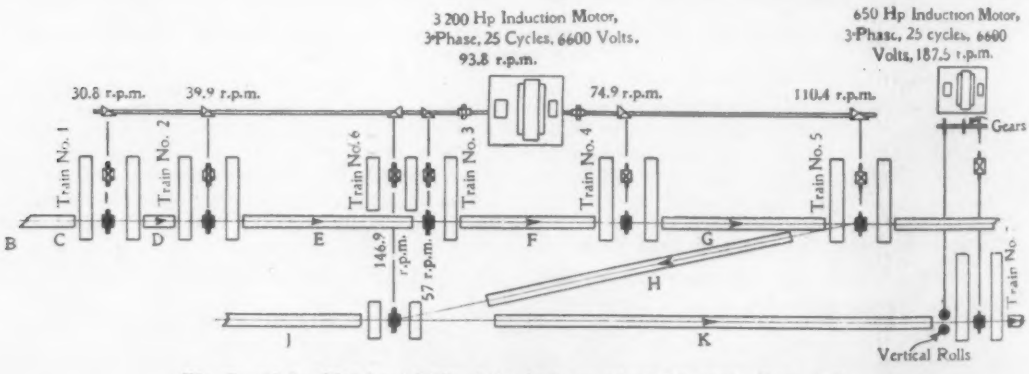


Fig. 7.—18-In. Merchant Mill of the Indiana Steel Company, Gary, Ind.

The motor is designed to perform the work as shown by the estimated load diagram at a safe temperature rise, or, in other words, is figured on an intermittent load basis, and thus the continuous rating given the motor is really an arbitrary one. The design of the motor is made according to the local conditions. For instance, where rope drive is used, giving flexibility between the motor and mill shaft, it is not necessary to make the motor excessively strong; the speed can be moderate instead of exceptionally slow, as is generally the case when the mill shaft is driven direct, and the rope sheaves give opportunity to place the necessary flywheel effect outside the motor, a good point where exceptional mechanical strength of motor is not actually required.

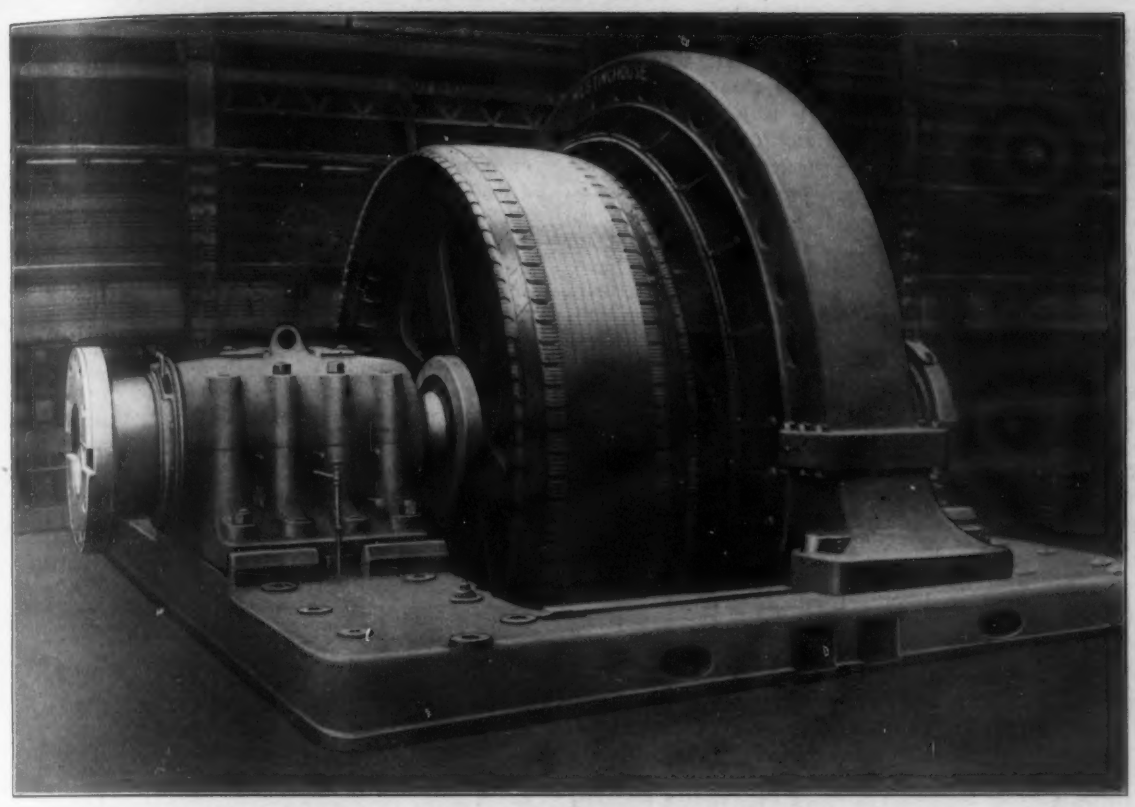


Fig. 8.—3200-Hp. Roll Motor with Stator Moved Aside to Allow Inspection of Rotor.

Features of the Motors

The 3200-hp. induction motor designed to perform the work indicated in Fig. 6 is illustrated in Figs. 1 and 8. This motor weighs approximately 300,000 lb. and has approximately 2,500,000-lb. flywheel effect included in the rotor, which is so designed that additional weight can be added to it should additional flywheel effect be desirable. The illustrations give a good idea of the general mechanical characteristics of the machine.

The primary (or stator) is of the open slot type, wound with form wound coils made of rectangular strap copper, thoroughly insulated and impregnated before winding. The coils are supported rigidly at the outer ends by means of an insulated steel ring fastened to the frame by a number of strong brackets. Means are provided for adjusting the stator vertically and horizontally at right angles to the shaft for adjusting the air gap, and also for moving the stator parallel to the shaft to allow for inspection of repairs.

The slot construction of the secondary, while of the partially inclosed type, thus tending to compensate for the effect of the unusually large air gap provided in such motors, permits the use of a completely insulated form wound coil. The overhanging tooth of the laminations assists materially in retaining the fiber wedge in place. This is of especial importance in the secondary as it is the revolving part. Band wires for retaining the overhung portions of the coil in place are objectionable, particularly from the standpoint of repairs when all work must be done in the field. A sectional ring is used in place of band wire on this machine, as shown in Fig. 8.

Thrust bearings are provided whose object is to care for ordinary thrusts due to wear of coupling boxes, but not excessive thrusts due to breaking of mill spindle. To provide for these thrusts the rotor is sometimes arranged to have a lateral movement of several inches without damage to any part except the holding bolts of the thrust bearings. Provision is made for shifting the

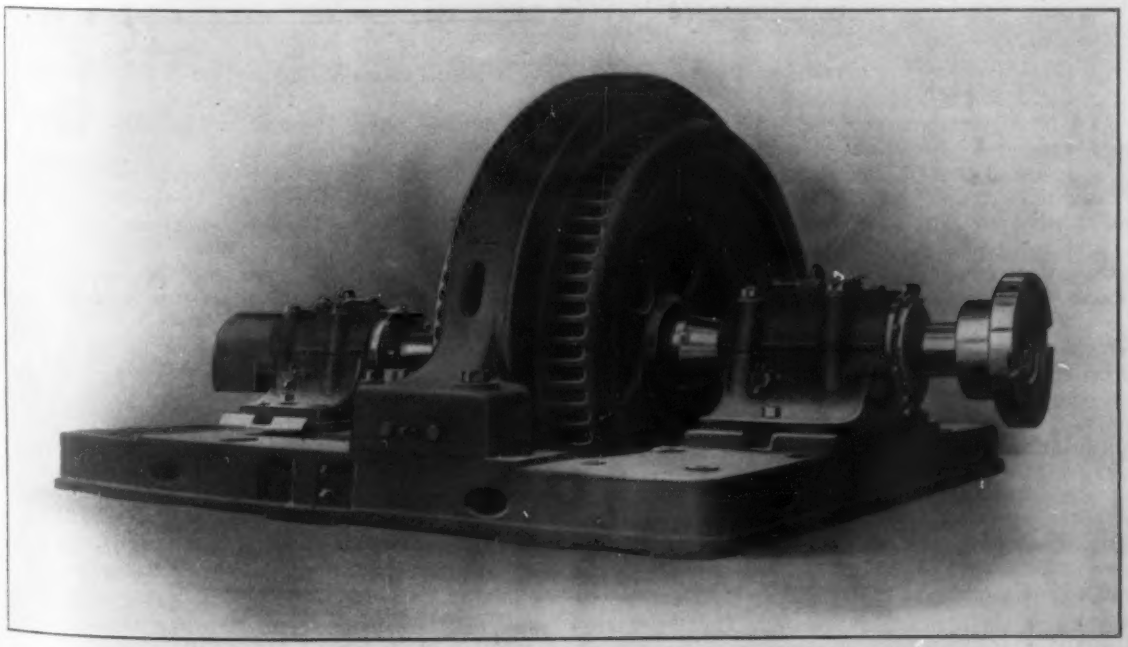


Fig. 9.—650-Hp. Roll Motor, Operating Finishing Rolls. 18-In. Merchant Mill.

entire brush rigging with the rotor so that the brushes will always stay on the collector rings. The thrust bearings are located at the end of the shaft opposite the coupling and are held by two bolts which are turned at one place to provide a breaking point. The bolts which pass through the bearing pedestal, together with the bed

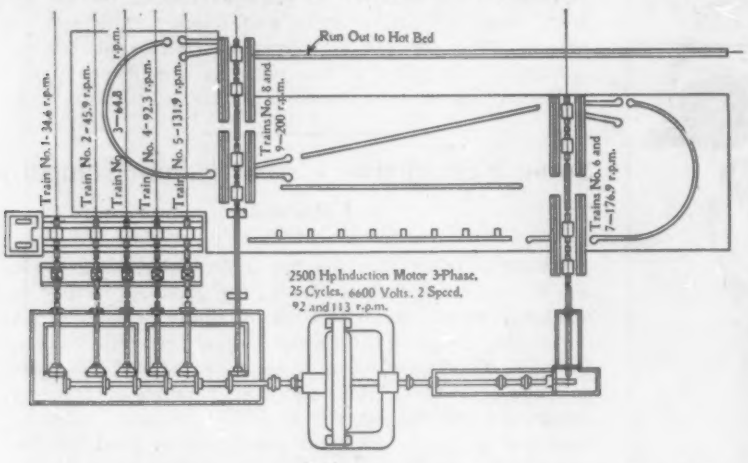

Run Out to Hot Bed
Train No. 1- 34.6 r.p.m.
Train No. 2 - 45.9 r.p.m.
Train No. 3—64.8
Train No. 4 - 92.3 r.p.m.
Train No. 5 - 131.9 r.p.m.
Trains No. 8 and 9—200 r.p.m.
Trains No. 6 and 7—176.9 r.p.m.
2500 Hp Induction Motor 3-Phase, 25 Cycles, 6600 Volts, 2 Speed, 92 and 113 r.p.m.

Fig. 10.—10-In. Merchant Mill of the Indiana Steel Company, Gary, Ind.

plates and parts, are designed to withstand the breaking stress of the holding bolts without injury.

The control outfit for this motor consists of two identical three-pole, single-throw, interlocking primary line switches with oil immersed contacts (one switch for each direction of rotation), a group of magnet switches with the necessary secondary resistance and with current limiting relays, a reversing drum type master switch, and shunt and series transformers for the relays. The line switches are so interlocked that only one can be closed at a time, and neither can be closed while the secondary switches are in other than the off position—that is, unless the secondary resistance is all in circuit. The line switches can be operated from the control pulpit or from the motor house. When the control circuit is open in the motor house the master switch and line switch operating mechanism in the pulpit are inoperative. Should the line switch be opened for any cause, or should the control circuit fail, all switches are immediately opened.

Motors in this service are seldom reversed, these cases arising only where material curls and tends to form a collar or for other reasons forms a cobble in the rolls. They start with resistance in the secondary circuit. As the speed increases this resistance is cut out by means of the magnet switches, each of which is under the control of the master switch, but is so connected as to automatically limit the current to a predetermined value and also limit the current to this same value at any time dur-

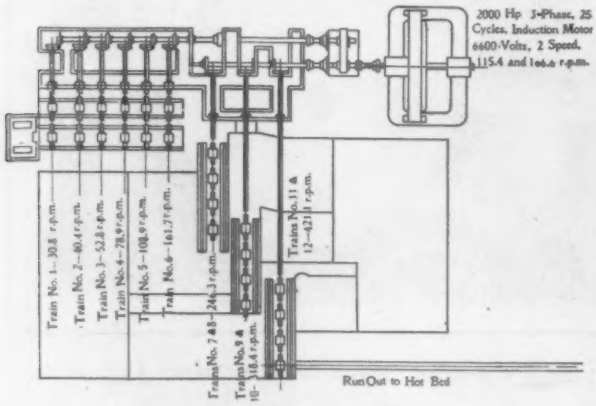

2000 Hp 3-Phase, 25 Cycles, Induction Motor 6600-Volts, 2 Speed, 115.4 and 166.6 r.p.m.
Train No. 1 - 30.8 r.p.m.
Train No. 2—40.4 r.p.m.
Train No. 3 - 52.8 r.p.m.
Train No. 4—78.9 r.p.m.
Train No. 5—108.9 r.p.m.
Train No. 6—161.7 r.p.m.
Trains No. 11 & 12—42.1 r.p.m.
Trains No. 7 & 8—246.3 r.p.m.
Trains No. 9 & 10—318.4 r.p.m.
Run Out to Hot Bed

Fig. 11.—12-In. Merchant Mill of the Indiana Steel Company, Gary, Ind.

ing the starting, except that the first notch of the controller is arranged to give sufficient torque to start the motor. The motors are operated in most cases with a permanent resistance in the secondary circuit, and provision is made for adjusting this resistance to cause a slip suited to the load condition.

Special provision must be made for stopping large motors with high flywheel effect, otherwise the momentum will keep the rotating part in motion for hours. Where direct current is available it can be used to excite the primary windings of the motor, and the energy generated in the secondary can be dissipated in resistance. A second method is to reverse a phase of the primary circuit and by means of a suitable auto-starter impress on the primary about one-half the normal voltage. The latter method, "plugging" the motor with half voltage, will cause a very quick stop.

The two-speed motors noted in some of the diagrams have two windings on both the primary and secondary, and it is possible with such an arrangement of windings to give three speeds, such as 120, 180 and 240 rev. per min.

The electrification of rolling mills has just begun. There is a great field for electric drive in the future developments of the iron and steel industries, and there are other applications, such as the electric furnace for steel refining, which are sure to give electricity a far more important place in these industries than it has held in the past.

January Copper Production and Stocks

An increase of 20,409,295 lb. in the United States stock of copper is shown by the report of the Copper Producers' Association for January, which is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States January 1, 1911	122,030,195
Production of marketable copper in the United States from all domestic and foreign sources during January	115,696,591
Deliveries of marketable copper during January:	
For domestic consumption	42,078,557
For export	53,208,739
Total	95,287,296
Stock of marketable copper of all kinds on hand at all points in the United States February 1, 1911	142,439,490

A sharp decline occurred in the production, January's output being 7,642,628 lb. under that of December. The domestic deliveries were a little below those of December, while exports were much below, serving to equalize the discrepancy between the association's figures and those of the Government for December.

The Steel Corporation's Unfilled Orders

The statement of unfilled orders on the books of subsidiaries of the United States Steel Corporation given out February 10 shows that the total on January 31 was 3,110,919 tons, representing an increase from December 31 of 436,000 tons. This is the first increase shown by these reports since the statement of December 31, 1909. Comparison is made below of the figures for January 31 with the monthly statements since the middle of 1910 and the quarterly statements back to December 31, 1908:

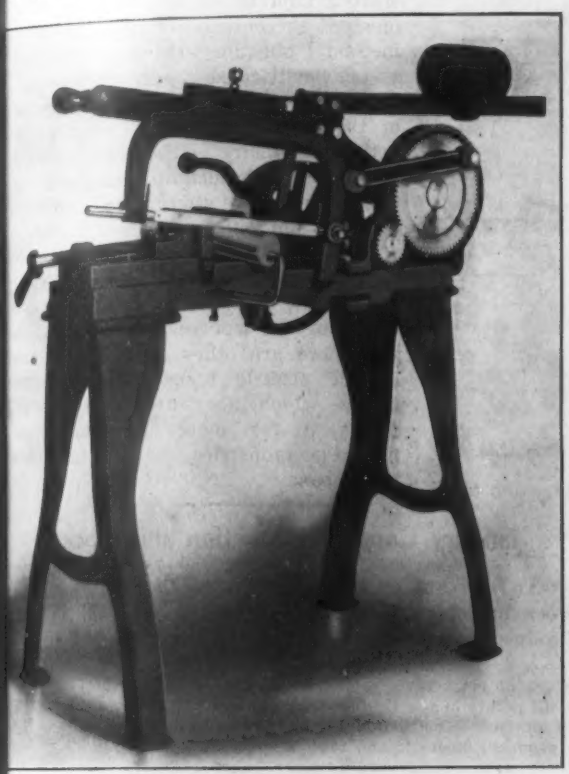
January 31, 1911	3,110,919	June 30, 1910	4,257,794
December 31, 1910	2,674,757	March 31, 1910	5,402,514
November 30, 1910	2,760,413	December 31, 1909	5,927,631
October 31, 1910	2,871,949	September 30, 1909	4,796,833
September 30, 1910	3,158,106	June 30, 1909	4,057,939
August 31, 1909	3,537,128	March 31, 1909	3,542,595
July 31, 1910	3,970,931	December 31, 1908	3,603,527

The unfilled orders at the close of the years preceding 1908 were as follows: 1907, 4,624,552 tons; 1906, 8,489,718 tons; 1905, 7,605,086 tons; 1904, 4,696,203 tons; 1903, 3,215,123 tons; 1902, 5,347,523 tons.

The Associated Foundries of Cincinnati held its annual meeting at the Business Men's Club, February 3. In addition to usual routine business, the following officers were elected to serve for 12 months: President, Henry Ritter, Lunkenheimer Company; vice-president, A. W. Williamson, Peck-Williamson Company; secretary, Victor Knecht, Knecht Foundry Company; treasurer, S. M. Blackburn, J. B. Morris Foundry Company.

The North Wales Geared Power Hack Saw

One of the special features of the new geared power hack saw made by the North Wales Machine Company, Inc., North Wales, Pa., is the use of a direct gear drive. These gears are machine cut and have cast iron covers to protect them. The tool has tight and loose pulleys



A New Type of Geared Power Hack Saw Made by the North Wales Machine Company, Inc., North Wales, Pa.

and a swivel vise, which enables stock having a maximum diameter of 3¾ in. to be cut at any angle not exceeding 45 degrees. The maximum capacity for straight cuts is 5½ in. A telescopic connecting rod enables a 12-in. blade to be used when cutting bevels, although the one regularly supplied is 2 in. shorter. Gravity feed and an automatic stop to shut off the power after the cut is completed are used.

The following table gives the principal dimensions and specifications of the machine:

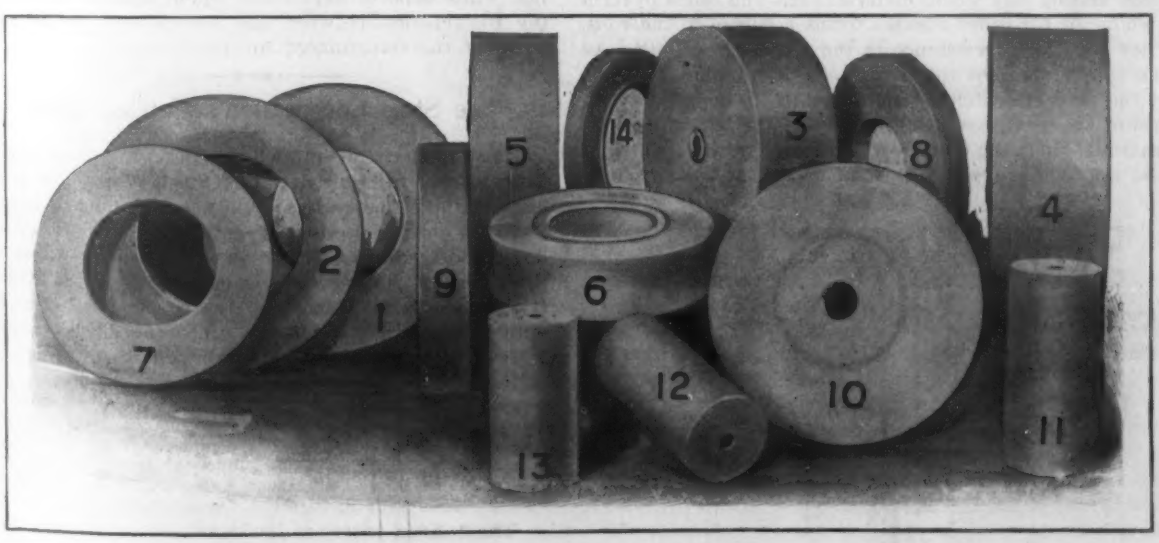
Maximum length of blade, inches	12
Cutting capacity for straight work, inches	5½
Cutting capacity for bevel work, inches	3¾
Ratio of gearing	3 to 1
Maximum swivel of vise, degrees	45
Depth of vise jaws, inches	2½
Width of vise jaws, inches	4½
Opening of vise jaws, inches	6
Length of stroke, inches	6
Diameter of tight and loose pulleys, inches	10
Face width of tight and loose pulleys, inches	1¾
Floor space, inches	17 x 30
Net weight, pounds	185
Shipping weight, pounds	225

The main bearing of the machine is 7 in. long and has a brass gib and set screw to take up wear. The mechanism for shutting off the power after the cut has been made is both positive and quick acting and the frame lifting handle is conveniently located for the operator. All parts of the machine are of heavy construction and the vise screw is of the extra heavy type.

Some Remarkable Carborundum Company Products

What is believed to be the largest vitrified grinding wheel ever made is included in the group of rather remarkable wheels herewith illustrated and recently turned out at the works of the Carborundum Company, Niagara Falls, N. Y. The wheel in question is marked No. 2 and is made of Aloxite, the new steel grinding abrasive recently put on the market by this company. The big wheel is 48 in. in diameter and is to be used for tool grinding by one of the carborundum customers in France.

Included in this group of wheels are several other examples of the comprehensive wheel making facilities of the carborundum plant. The net weight of the wheel group is 8350 lb. It includes two massive carborundum drum wheels, Nos. 3 and 4, which are 39¼ in. in diameter and 16⅛ in. thick, which are to be used for hulling grains; No. 6, vitrified Aloxite wheel, 36 in. in diameter, 9 in. thick, to be used in pointing cast steel wire; No. 5, drum wheel, silicate Aloxite, 40 in. in diameter, 14 in. thick, to be used in grinding mower sections; No. 9, silicate Aloxite wheel, 40 in. in diameter, 4 in. thick, to be used for grinding corset steel; No. 14, silicate Aloxite wheel, 36 in. in diameter, 4 in. thick, to be used for tool grinding; No. 1, silicate Aloxite wheel, 48 in. in diameter, 3 in. thick, to be used for grinding cutlery steel; No. 8, vitrified Aloxite wheel, 36 in. in diameter, 4 in. thick, to be used in grinding angle iron; No. 7, silicate Aloxite wheel, 39 in. in diameter, 3 in. thick, to be used in glass grinding; No. 10, carborundum wheel, 40 in. in diameter, 8 in. thick, to be used in grinding structural steel; Nos. 11, 12 and 13, vitrified carborundum cylinders, 12 in. in diameter and 26 in. long, to be used in grinding vitrified tile.



A Group of Remarkable Grinding Wheels Recently Turned Out by the Carborundum Company, Niagara Falls, N. Y.

These wheels cover a widely different assortment of work and serve well to show the grinding possibilities of carborundum and the new abrasive, Aloxite. The facilities at the carborundum plant make it possible to quickly supply wheels for all classes of grinding, not only in all of the regular or standard shapes and sizes, but also in any special shapes and sizes made in accordance with the customer's sketch or blue print.

A Wire Rope of Exceptional Type

Made by the John A. Roebling's Sons Company, Trenton, N. J.

Improved methods in the heat treatment of steel have recently led to a material increase in the size of wire that can be used for wire haulage rope. A record has been made in this direction in the manufacture by the John A. Roebling's Sons Company, Trenton, N. J., of a haulage rope, 3 in. in diameter, 7810 ft. long, and weighing over 123,000 lb. This rope has a breaking strength estimated at 377 tons and is remarkable, not alone because of its great size and strength, but also because it contains larger wires than have been heretofore regarded as practicable to manufacture for stranding into rope to be bent around a drum under a heavy load.

As is well known, the designs of wire ropes to be used for hoisting or haulage are influenced largely by the sizes of the drums around which they are to be wound. A rope to be wound around a drum of comparatively small diameter must naturally be more pliable than one which will not be subjected to short bends. The number of strands in a rope and the number of wires in each strand also bear a relation to the rope's diameter, and when a very large rope is wanted it is usually considered necessary to depart from the construction employed for smaller sizes.

For example, the standard haulage rope up to 1½ in. in diameter is made of six strands of seven wires each twisted around a hemp center. For larger sizes six strands of 19 wires each are used, unless the rope is to be subjected to short bends, or a very large diameter is wanted, when the number of wires in each strand is increased to 37 or more. An advantage is gained by using a small number of wires in a haulage rope, because the wires, being larger, naturally present better resistance to abrasion. In addition to the wear to which it is subjected, if a rope is of very large diameter, a crushing strain develops when it is wound on a reel under a heavy stress. This crushing strain can be much better resisted if the strands are composed of a small number of thick wires instead of a large number of wires of comparatively fine diameter.

When, therefore, the Spanish-American Iron Company, for whom the large rope referred to above was made, proposed to haul a load of more than 330,000 lb. of iron ore up an incline 6716 ft. long, it became very important to equip the incline with a rope that would not only take the direct pull with a liberal factor of safety, but that would also have ample power of resistance to the crushing strain which would come upon it when wound on the drum. Calculation showed that a plow steel rope 3 in. in diameter would be strong enough to take the load, and in order to eliminate short bends the operating machinery was designed with drums 20 ft. in diameter.

It was then proposed, instead of twisting six strands with 37 or more wires in each around a center, to follow the usual construction for smaller ropes and place 19 wires in each strand. Instead, however, of using a hemp center, the strands were twisted around a center which in itself was a wire rope 1⅛ in. thick, composed of six strands of 19 wires each and a hemp core. This construction required for the outer strands wires ranging from 0.175 to 0.225 in. in diameter. It is not uncommon to draw wires as large as these for ordinary commercial uses, but to produce such wires with the strength, toughness and pliability of finer sizes called for the application of the most modern processes of making steel and great care in every detail of manufacture.

Wire Rope of Exceptional Type Made by the John A. Roebling's Sons Company, Trenton, N. J. This engraving reproduces its exact size.

The manufacture was begun at the furnaces at the Roebling Works with the production of steel that exhaustive tests showed to be possessed of the physical qualities essential for rope wire, and this steel was rolled and drawn into the requisite number of coils to form the strands. Sample pieces taken from each end of each coil were subjected to tests in torsion, bending and direct tension. The results of these tests confirmed the favorable result of the tests of the steel, and the fitness of the wire was further demonstrated when, notwithstanding the thickness of the largest wires, they were readily stranded into rope.

To facilitate handling, the length of the rope was distributed over three reels loaded on two cars, the largest of these reels being 10 ft. high and 9½ ft. wide. These reels were loaded on a vessel in New York for shipment to Cuba, where the mines of the Spanish-American Iron Company are located, and were handled at the place of destination without difficulty.

The Wisconsin Engine Company, Corliss, Wis., is installing in its machine shop an erecting floor of massive concrete construction, with a wood block surface, which will be of material assistance in erecting the heavy machinery which constitutes the greater part of the output of the company.

New England Foundrymen

Data on the Cost of Permanent Molds

At the monthly meeting of the New England Foundrymen's Association, at the Exchange Club, Boston, February 8, Edgar A. Custer, president of the Tacony Iron Company, Philadelphia, read a paper on "The Permanent Mold," illustrated by lantern slides. The Millett Brass Company, Springfield, Mass., and the Union Steel Casting Company, Jamaica Plain, Mass., were elected to membership. The usual dinner was enjoyed. Herbert E. Wetherbee, the new president, was in the chair.

Mr. Custer's paper covered much ground that has been made familiar to readers of *The Iron Age*. The following extract is from the portions dealing with the cost of operations and the life of the iron mold:

"In April, 1910, a statement was made by me that this process was not dependent upon skilled labor, and that ordinary laborers could be employed upon it without previous experience and get economical results. In order to test this out, on Friday, April 21, 1910, we hired 18 men from the street, 16 of whom could not speak English and but one of whom had ever been in a foundry before. On Friday and Saturday we simply pushed these men around and endeavored to teach them not to be afraid of the molten iron. To the 18 men we added three of our more experienced workmen, and on Monday these 21 men were turned over to an outside concern, which then assumed entire charge of this portion of the plant. Account was taken of the number of castings made, the hours of the men and the costs that entered into the production of these castings. There were 37 molds. The average molding cost alone for these castings, when made in sand, was 6 cents each, figured on a piecework basis. The results of this test follow:

	Number hours work.	Number castings made.	Cost per piece.
Monday	7	896	0.023
Tuesday	10	1,419	0.021
Wednesday	10	1,767	0.0169
Thursday	10	1,972	0.0152
Friday	10	2,174	0.0138

"The cost of these castings when made in sand, for molders' labor alone, was $9.02 per ton. The molding cost the last day of this test was $2.14 per ton. To the molding cost of the castings, when made in sand, must be added rumbling and cleaning and the cost of sand. So much for the old way as compared with the permanent mold process.

"Each mold is primarily designed to produce 1000 lb. of castings per day, and in our room containing 37 molds there were produced 18 tons of good castings in 10 hours. The floor space required by these molds is 60 ft. long by 26 ft. wide, and to produce the same tonnage of the same castings in sand a floor space of 400 ft. long by 105 ft. wide would be required; also to produce the same tonnage in sand the services of 54 expert molders would have been required, whose pay would average $3.50 to $4.50 each per day.

"The question that invariably crops out when we are talking of iron molds is, 'How long do they last?' I have been working them continuously for five years, and can only say: 'I don't know.' The only place where the molds disintegrate is in the runners and gates. The matrix of the mold never, in our experience, shows any signs of wear or crumbling. After we have made from 7000 to 10,000 castings we generally renew the gates by inserting new blocks. The cost of this repair is generally 10 per cent. of the original cost of the mold. We have made 21,000 castings in a single mold, each casting weighing 10 lb., and the matrix to-day shows the original tool marks. The life of the mold does not depend so much upon the number of castings poured into it as upon the number of times it is allowed to become cold. Working a mold continuously day and night will quadruple the number of castings that may be made before repairs are required."

The Cheboygan Bridge & Boiler Works is a new company which has bought the Cheboygan Boiler Works, Cheboygan, Mich. It will continue the business of making and repairing boilers, but will add the construction of steel bridges under the direct management of R. A. Raymond of Saginaw, Mich., formerly with the Joliet Bridge & Iron Company. Operations in the new line have already begun and conditions warrant a good volume of business.

Pennsylvania Railroad Freight Stations in Philadelphia

The Pennsylvania Railroad Company is to issue a large wall map of Philadelphia, the purpose of which will be to point out to shippers the location of Pennsylvania Railroad receiving and delivering stations in that city. As this is, however, the second map of the kind the company has issued since 1897, it shows in diagram form the remarkable development of railroad facilities in this city within recent years—facilities required by the fact that Philadelphia has become the leading manufacturing center of the world. The map shows the route of Pennsylvania Railroad tracks in that city, of which there are altogether 443 miles. By far the greater part of this is for the direct use of Philadelphia industries, although the map shows the route of the so-called high line, or elevated double track freight railroad, planned by President Cassatt to connect the Main Line and the New York Division with the Delaware Extension and the Philadelphia, Baltimore & Washington Railroad, and intended especially for the coal trains running between Harrisburg and the Delaware River, as well as for large merchandise traffic handled at Dock street terminals in Philadelphia.

Within the 129 square miles in the city of Philadelphia, this map shows the location of 56 separate and distinct shipping and receiving points on the Pennsylvania Railroad, or an average of about 1 to every 2½ square miles. This extraordinary number of stations—which is greater than any other railroad has in any other city—has been brought about by the fact that the manufacturing and shipping interests of the city are so widely distributed that in order that shippers should not be subjected to excessive charges for drayage, there should be established a station and a carload delivery yard in every well defined section of the city.

Attention is also called by the new map to the fact that in the central portions of the city, where the retail and wholesale houses are located, there are to-day spacious buildings at the Dock Street Station, Walnut Street Station and Wharf, Vine Street Station and Washington Avenue Station, furnishing facilities for handling the extraordinarily large miscellaneous freight traffic. The value of these stations to shippers is attested by the large amount of traffic consigned to them.

The map also gives the names of stations at which cranes, track scales and wagon scales have been installed. It shows, for example, that at the Shackamaxon Station an electric crane has been built, which will lift 40 tons. At the Fifty-second Street Station there is a crane with a capacity of 30 tons. Huge cranes and scales have been built at other stations, in order that the handling and weighing of freight might be facilitated to the greatest possible extent. On this map are pointed out the names of the stations at which freight may be loaded to the different directions in which the Pennsylvania Railroad radiates from Philadelphia, thus showing the network of tracks required to enable the shippers of that city to load their freight and have it hurried away within the shortest possible time.

The Armor Steel & Foundry Company, First National Bank Building, Chicago, and Matthews, Ind., is the purchaser of the Steel Foundry Company's old plant at Winton place, Cincinnati. The equipment at its Matthews, Ind., plant will be moved to Cincinnati. The present Winton place building is 134 x 200 ft., and a 215-ft. addition will be made, making the structure 515 ft. long. The new addition will be of steel and concrete construction, conforming with the old building. The company will manufacture steel castings under the Gebhard process and will need some additional equipment for its new plant.

The Machinery Markets

The machinery demand is steadily improving. An encouraging feature is that the buying is conservative and not caused by any fear of advancing prices. The call for equipment is so general and such a wide variety of machinery is asked for that about every branch of the trade is feeling the betterment. The railroads continue to occupy the chief attention of the trade. Some business is being placed in New York, although nothing has been bought as yet against the large list mentioned last week. The railroads are buying in Chicago and a good call exists there for small tools. New England reports a good supply business, and an encouraging indication there is contained in the fact that the New York Central and the Boston & Maine systems increased their freight earnings in January. The Pennsylvania and the Reading railroads have been making inquiries for tools in the Philadelphia market. In Cleveland there is an increased volume of business, mostly for small lots. Similar conditions exist in the South, and in St. Louis there is a decidedly improved demand for all kinds of machinery. The export demand for machine tools and mining machinery continues to give the market good support. A list of mechanical equipment which will perhaps aggregate $50,000 has been issued by the Everett Mills, Lawrence, Mass., and the buying will be done from there.

New York

NEW YORK, February 15, 1911.

Orders are being placed against the liberal inquiries which appeared in the New York market early in January, and a good general business is being done. It is not often that the machinery houses in this vicinity bid on such a varied assortment of requirements as have come forward recently. Textile machinery, wood working equipment, metal stamping presses, sugar mill machinery, conveying equipment and machine tools are all in good demand, and most of the business that has come forward has been in the way of inquiries for one or two machines. In some lines manufacturers actually have all they can handle. This is especially true with certain makers of special automatic machinery, such as screw machines. The increased activity is reflected in the bookings of the International Steam Pump Company, which show that the volume of orders placed with it in January was 50 per cent. greater than the bookings of the corresponding month of last year. An encouraging feature is that most of the people buying machines are not getting them for replacement, but are adding to their manufacturing facilities, and in consequence there are fewer offerings of second-hand machinery than are usually made when good buying is being done. The demand for second-hand machinery continues especially good and dealers have no trouble in getting good prices for used equipment. Jobbing foundrymen in this market are becoming more active, and those who make a specialty of turning out machinery castings declare that orders are better than they have been at any time within the last five months.

Work has been begun on the second unit of the Argo plant in course of construction at Chicago for the Corn Products Refining Company, 26 Broadway, New York. The company has a large plant already in operation at Chicago, and it has been adding to it for some time, and has been a liberal purchaser in the machinery trade, largely for power equipment, conveying machinery and special machinery. The site on which this plant is being located is 100 acres in extent and at present about 25 acres are covered by buildings. It is the intention to continually extend the plant until all of the property is occupied by manufacturing structures.

The M. H. Treadwell Company, 140 Cedar street, New York, is inquiring for a line of machine tools for installation in a plant at Easton, Pa. The company is asking for a line of slightly used tools, and has also been making inquiries with houses handling only new equipment.

The Rome Mfg. Company, Rome, N. Y., does not manufacture rubber equipment, as was stated in *The Iron Age* of February 2. The company makes sheet metal ware, and the building mentioned was erected last year and is thoroughly equipped and in operation.

The Positive Clutch & Pulley Works, Buffalo, N. Y., has been incorporated under the laws of the State of New York with a capital stock of $100,000, and will manufacture a complete line of combination jaw and friction clutches for transmission work and a line of steel center wood rim pulleys. The company has arranged for the erection of a large three-story brick factory at 32 and 34 Lansing street, adjacent to the New York Central Railroad Belt Line and will install the requisite equipment of machinery. The officers of the company are C. S. Hook, president; V. P. Beard, vice-president; S. A. Benedict, treasurer and general manager; E. L. Worbois, secretary.

George Laub & Sons, tanners, Buffalo, N. Y., will build and equip a five-story addition, 120 x 120 ft., to their plant at Clinton street and the Erie railroad. The Turner Construction Company has been awarded contract for the building.

The Board of Water Commissioners, Ogdensburg, N. Y., will receive bids until March 7 for the construction of covered sand filters, pipe lines, boilers, water turbines, steam and electrical pumping machinery and other electrical equipment and mechanical appurtenances for new water works plant. Hazen & Whipple, 103 Park avenue, New York, are the consulting engineers in charge.

The New York, Ontario & Western Railroad Company has completed plans for the erection of a machine shop at Middletown, N. Y.

The Buffalo Belt Company, North Tonawanda, N. Y., has completed arrangements for the erection of an extensive addition to its plant at East avenue, Oliver street and the New York Central Railroad and Erie Railroad.

Henry W. Littlefield, successor to Littlefield & Clark, Buffalo, N. Y., has established a manufacturing plant at 21 Illinois street for the manufacture of gasoline motors and portable combination self-powered working machinery for contractors and builders' use. A specialty will be made of the manufacture of the Simplex woodworker, a machine equipped with nine woodworking tools including jointer, saws, boring machine, &c., operated by a gasoline motor built in to the machine.

A three-story and basement shop building, 50 x 169 ft., with three-story wing, 32 x 45 ft., will be erected and equipped by Cornell University at Ithaca, N. Y., in connection with the Rand Hall Memorial Building. Bids will be called for about March 15 by R. H. Treman, chairman, Building Committee.

The Rudolph Wuslitzer Mfg. Company, North Tonawanda, N. Y., manufacturer of musical instruments, is having plans prepared for an extensive addition to its plant at Sawyers Creek and the New York Central Railroad.

Chicago

CHICAGO, ILL., February 14, 1911.

The machinery trade is beginning to feel the quickening impulse and has taken another step the past week in the direction of a normal volume of business. There is still quite a distance to travel, but Chicago dealers are encouraged by the steady growth in the number of inquiries and orders. The out of town trade seems to be in the lead in the matter of improvement. Manufacturers in Wisconsin, Iowa and the Northwest are sending in good orders, especially for small tools, and there are also more inquiries from Chicago industries.

The Motor Truck Show has attracted a great deal of attention among business men. The field for the use of trucks is so large and inviting that it may put the automobile industry on its feet again and result in a further extension of manufacturing facilities in that line, which will mean a market for many millions of dollars' worth of high grade machine tools.

The railroads are doing a little more business in random orders for shop tools, and a settlement of the rate question may enable them to make more extensive purchases.

The Marshall & Huschart Machinery Company, Chicago, recently closed an order for shipment to Berlin, Germany. This was a preliminary order for equipment for the new Berlin plant of the Otis Elevator Company.

The Chicago, Ottawa & Peoria Railway has under con-

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struction at Ottawa, Ill., a shop building, 62 x 302 ft., which will contain three tracks, two of which will be repair pit tracks and the third will terminate in a paint shop. In addition to this there will be erected a boiler room, heater house and a blacksmith shop and brass foundry. The ultimate size of the shop is expected to be 302 x 302 ft., it being the intention of the road to increase the size as fast as appropriations are available. One corner of the building will contain the offices and drafting room and will be three stories, with a store room on the first floor. The shop will be equipped with a crane of 50 tons capacity, wheel presses, lathes and other machinery, all of which will be motor driven. A sprinkler system will also be installed.

The Brunswick-Balke-Collender Company, Chicago, Ill., has closed a deal with Dubuque, Iowa, for ground upon which it will erect a new factory as soon as the frost is out of the ground. The first buildings will be one story, saw tooth roof, of brick construction, and will contain about 280,000 sq. ft. of floor space.

The Chicago Varnish Company, Chicago, has increased its capital stock from $200,000 to $1,500,000.

A project for the establishment of a central heating station at Elgin, Ill., is being promoted by Henry Muntz and others of that city. Plans for the incorporation of a company with $500,000 capital stock are being arranged, but details have not been worked out.

The City Council of Deland, Ill., is preparing to establish a water works system.

The Central Station Engineering Company, 164 Dearborn street, Chicago, is preparing plans for a central heating plant for the Kokomo, Marion & Western Traction Company, Kokomo, Ind., to be constructed at a cost of $250,000. The same engineers are also preparing plans and will be ready for bids about February 12 for an extension of the city water works, power system and mains and enlarging the power plant and lighting system for the city of Logansport, Ind. The company also has plans in progress for a central heating plant to be constructed at Anderson, Ind., by a stock company, of which I. E. May, 1009 Main street, Anderson, Ind., is secretary.

The A. E. Staley Mfg. Company, Decatur, Ill., will begin work early in the spring on extensive improvements to its plant. About $350,000 will be expended by the company.

The Moline Scale Factory, East Moline, Ill., has purchased a tract of ground which adjoins its present property, which it will hold for future growth.

The Economy Light & Power Company, Coal City, Ill., is making preparations for the erection of a new plant. The building will be of fireproof construction.

The Rock Island Sash & Door Works, Rock Island, Ill., has increased its capital stock from $100,000 to $500,000, but advises that it is not contemplating any improvements.

Ziegler-Schryer Mfg. Company, Freeport, Ill., gasoline engines, will erect a machine shop, 80 x 200 ft., contracts for which will be let in about 30 days.

Springfield, Ill., will expend $135,000 for improvements to its water works, including the installation of a new pump.

The Atwood Vacuum Cleaner Company, Rockford, Ill., has been incorporated with a capital stock of $50,000. The incorporators are James T. Atwood, Howard C. Atwood and Myra C. Atwood. The company will engage in the manufacture of electrical machinery.

The Metropolis Foundry Company, Metropolis, Ill., has been incorporated with a capital stock of $3500. The incorporators are F. W. Borman, Edgar Jones and Charles C. Leonard. The company will engage in general machinery and foundry work.

The Interstate Cement Products Company, Hoopeston, Ill., has been incorporated with a capital stock of $10,000. The incorporators are J. H. Hutton, Thomas Woolverton and H. G. Carr. The company will engage in the manufacture of cement, tile, concrete blocks, &c.

The American Heating & Supply Company, Rockford, Ill., has been incorporated with a capital stock of $40,000. The incorporators are Fred K. Houston, Merritt H. Mott and Charles Franz. The company will engage in the manufacture of heating plants.

The Burlington Tool Committee

The system of purchasing machine tools, which has been adopted by the Chicago, Burlington & Quincy Railroad has invited a great deal of favorable comment among dealers and manufacturers. While it has been the custom of railroads and other large buyers to have committees which consider and recommend specifications or the purchase of machinery, the Burlington committee seems to have more power of initiative and has adopted a more progressive policy.

This committee made its appearance in the trade last fall in connection with purchases for new shops at Havelock, Neb. The committee visited all the Chicago dealers and made an extensive trip among the manufacturers soliciting demonstrations of machines and all the practical information that could be obtained from the experts of the manufacturers. The results were evidently satisfactory to the executive management of the Burlington system, as the committee is continuing its work by carrying through on the same plan occasional purchases for other shops of the system.

It seems that for about 20 years the Burlington has had an "Association of Operating Officers," which holds regular meetings, the chief object of the association being to promote efficiency and to secure general discussion by all the operating officers of proposed improvements. The Tool Committee is a regular committee of this association. It has no power to make purchases for the company, but it recommends all purchases of machine tools, and it usually specifies two or more competing machines before actual purchase is authorized or bids invited.

This committee is composed of the most capable men for its work in the employ of the company. One member is the company's "superintendent of piecework," who travels over the system promoting piecework in all the company's shops, and at the same time keeping in touch with the progress of shop efficiency on other railroads and in commercial plants.

The committee has grown into an interesting piece of corporate machinery. It affords the executive management of the company a safe guide in appropriating money or authorizing improvements, and its successful record has given the progressive men who constitute the committee a degree of initiative that is unusual in railroad shop management. The individual shop foreman or superintendent often hesitates to recommend innovations or improvements, because a mistake in judgment would be a set back in his position with his company which would count more than credit for successful work. As a result of this peculiar phase of corporate psychology the foreman or superintendent is usually content to travel along in a rut, and when new machines are required he recommends those which have been used in the shop for 10 to 40 years, without profiting by the progress of the machine tool industry.

The shop payrolls of railroads in the United States amount to about $250,000,000 annually, while reports show the expenditure of only $8,000,000 to $10,000,000 for shop equipment. There has been remarkable progress in the past 10 or 20 years in the efficiency of locomotives and train equipment, as well as in track and bridge construction, but the railroad shop has become a form of backwater in the stream of progress in railroad management.

The system adopted by the Chicago, Burlington & Quincy is apparently throwing light on this problem in railroad management. Recently the committee has disposed of a number of old machines, which have been replaced by new tools. Some that were found to have no commercial value in the market for used tools have been scrapped. These are unusual occurrences in the management of railroad shops. The committee has also shown a willingness to recommend the purchase of new tools that have never been used in railroad shops. When its members are out on an investigating trip and are entertained by a machine tool manufacturer or dealer they show a preference for water, while their strict attention to business has occasioned much comment.

Cincinnati

CINCINNATI, OHIO, February 14, 1911.

Machine tool builders report rather irregular conditions for the past few days. The inquiry is excellent, but not many actual orders are coming in. Lathes are more in demand than any other class of tools. Small dynamos and motors are good sellers and the demand for boilers holds up well. Makers of steam fittings and engineers' specialties are all busy, and, taking everything into consideration, the business situation, so far as manufacturers are concerned, shows a steady improvement. However, in judging conditions in most lines, a period of at least a month should be considered instead of a week. Foundrymen are feeling very much more encouraged. Second-hand machinery dealers are also doing a little better.

A. C. Harrison, W. M. Lockett and J. W. Muster, all of McLean, Ky., have incorporated the Calhoun Planing Mill Company.

The Fisher Auto Top Company, Norwalk, Ohio, has been incorporated, with $10,000 capital stock, to manufacture automobile tops. The incorporators are William A. Fisher, L. M. Fisher, Lawrence Fisher, M. Fisher and R. E. Thiesen.

The Cahill Shoe Company, Cincinnati, whose factory was recently destroyed by fire, has acquired a building on Denman street, and will fit it up with modern machinery for the manufacture of shoes.

The Noyes Company, Dayton, Ohio, manufacturer of

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special machinery parts and novelties, contemplates enlarging its plant.

For the purpose of manufacturing machinery for handling peat and its products, the Union Peat Company, Toledo, Ohio, has been incorporated with $25,000 capital stock. The principal incorporators are T. B. Jarvis, O. J. Sigler and C. J. Scott.

The Hisey-Wolf Machine Tool Company, Cincinnati, has completed the installation of the machinery in its new plant. The demand for export trade for its drills and grinders is reported to be rapidly increasing.

The Griess-Pfleger Tanning Company, Cincinnati, has purchased the property which it now occupies under lease in Chicago from the Grey, Clark & Engle tannery. The company will construct at once a modern tannery, representing an investment of $200,000 in buildings.

There is an unconfirmed report that the Lockport Stamping Company, Lockport, N. Y., manufacturer of automobile accessories, will build a plant at Findlay, Ohio.

The Vanadium Steel Company has been incorporated at Morgantown, W. Va., with $50,000 capital stock. The incorporators are Albert Loeb, John M. Gregg, William H. Brand, A. Mornisch, Leopold Sigwart, A. R. Price and John A. Purinton, all of Morgantown.

A creditors' meeting of the Cincinnati Punch & Shear Company has been called for February 17. C. J. McDiarmid, Blymyer Building, Cincinnati, is receiver.

The Producers Supply & Tool Company, Marietta, Ohio, has been incorporated, with $30,000 capital stock, to deal in second-hand machinery and scrap material. The incorporators are E. W. Le Fever, M. Le Fever, Ike Ruby and David Ruby.

The Swope Garage & Machine Company, Washington Court House, Ohio, has been incorporated, with $10,000 capital stock, to take over the automobile repair and machine shop of George B. Swope. Some extensions of the business are contemplated. George B. Swope, Elmer Jank and J. E. McLean are named among the incorporators.

The City Council of Canton, Ohio, is planning to purchase a gasoline engine to furnish power for the auxiliary water works and pumping station and for lighting the city auditorium.

The City Council of East Liverpool, Ohio, will expend $175,000 for extending and improving water works system.

The National Metal Specialty Company, London, Ohio, recently incorporated, has been dissolved and its entire plant has been taken over by the Thomas & Armstrong Company, London, Ohio, an old established company. Extensive improvements are being made to the plant, including the erection of a large building for the manufacture of radiator shields, metal shingles, metal lockers and metal furniture. Machinery is being installed which will enable the company to manufacture everything made of sheet metal. The factory will be in charge of Harry C. Hames, one of the foremost sheet metal manufacturers in the United States.

At the regular foremen's session of the Continuation School, February 9, Fred. Knaft, of the Bradford Machine Tool Company, delivered an interesting address on Master Screw Cutting. Interest in the school is rapidly increasing, and the attendance at the last meeting numbered over 60 foremen and superintendents.

Philadelphia

PHILADELPHIA, PA., February 13, 1911.

Orders coming to merchants and manufacturers do not show any material improvement. Some little business is moving, but it is usually in the nature of the smaller propositions. In certain lines of special work, a more active demand is reported, and here and there a manufacturer is found who is pretty well supplied with work and is running full capacity. Generally speaking, however, builders report the demand as irregular, with plants operating on an unsatisfactory basis. There has been a little more inquiry for equipment coming from both the Pennsylvania and the Reading railroads and the trade feels that it will not be long until more activity from that class of buyers will develop, particularly in view of the fact that some roads have announced their intention in going ahead with extension work planned, but which has been held up for some time. The improved condition of the steel trade is also looked upon as a factor which will result in more active conditions and ultimately have an influence on machine tool buying. In a few instances an improvement in the demand for second-hand machinery is reported, but buying continues irregular and while some fairly good business is being figured on, there has been little actual improvement in sales. A moderate business in boilers and engines is reported, both in new and second-hand equipment; boilers have been the most active, but there is little important business in engines pending.

The American Can Company, which now occupies a large building for manufacturing purposes at Twenty-first street and Washington avenue, has, it is stated, obtained an option on a portion of the old Neafie & Levy ship-building property at Beach, Palmer and Allen streets, which is to be used as a site for a large manufacturing plant. Details are not available, but it is said that estimates for the erection of two four-story buildings, to occupy a lot 115 x 340 ft., are being taken.

The contract for the new plant for the S. S. Wentzell Machine Company, at the corner of Fiftieth street and Parkside avenue, 100 x 150 ft. (one story), has been given to the Philip Haibach Construction Company, which will begin work at an early date. No important additions to the machinery equipment of the plant will be required, and we are advised that the power plant for the new shop has already been provided for.

Fire destroyed the blacksmith shop of the Tindel-Morris Company, Eddystone, Pa., on February 8. While the building was destroyed, temporary quarters were provided in one of its other departments, pending the re-building of the burned shop, which will be immediately begun. The fire will in no way interfere with the company's business. An increased demand is experienced for forging work, but for the line of special tools the inquiry still remains rather quiet.

A company has been formed at Lewes, Del., with a capital stock of $200,000, which will erect a plant for the manufacture of fish oil, &c. The officers of the company are: president, William G. Lofland; vice-presidents, D. W. Burbage and W. H. Bookhammer; treasurer, John R. Baylis, and secretary, James F. Lark. Work on the plant is expected to be started at an early date.

The Philadelphia Roll & Machine Company, reports the receipt of moderate orders for sand and chilled cast charcoal iron rolls from steel iron and rubber mills, but notes that buyers are not yet disposed to make purchases for extended requirements. Recent orders have hardly been sufficient to keep the plant operating full capacity, but from inquiries in hand a better demand in the near future is anticipated.

The city of Chester, Pa., will receive bids until February 20 for the construction of a pier at the foot of Market street, also for the construction of a bulkhead at the foot of Edgemont avenue, that city. Plans, specifications and further information may be obtained at the office of the City Engineer, Chester, Pa.

City permits have been taken out for the erection of a one-story tank house, 42 x 53 ft., with a wing, 32 x 38 ft., a storage building and garage, 46 x 174 ft., and a dryer building, 54 x 62 ft., to be built at Forty-ninth street and the Schuylkill river, for the Penn Reduction Company.

A slight fire damaging one of the departments of the Duplex Metals Company's plant, Chester, Pa., on February 4, is reported. There was no important machinery damage, and the fire will in no way affect the production or deliveries of the company's product.

Dienelt & Eisenhardt, Inc., have recently booked very satisfactory orders for special equipment. One order for a very large machine for oil cloth printing work has been received from New England parties. The demand for dead stroke and special bracket hammers has improved materially as has also that for hydraulic jacks, with orders for both these lines coming out more freely. Sufficient work is now on the order books of this concern to keep its plant fully occupied for some four or five months.

The Dallastown Furniture Company, Dallastown, Pa., has been incorporated with a capital of $50,000, and will erect a manufacturing plant. A. F. Fix is president; Charles Kohler, vice-president; J. H. Myers, secretary; John C. Heckert, treasurer. A committee consisting of John C. Heckert, Charles Kohler and L. Tarbet, of Dallastown, and Flavel Seitz of Glen Rock, Pa., will have charge of purchasing the equipment, comprising boilers, engines, electric light and power plant, wood working machinery, dry house kilns, general mill fixtures, &c., incident to the manufacture of furniture.

The Temple Malleable Iron & Steel Company has recently been formed and has taken over the plant of the Temple Ornamental & Structural Iron Company, Temple, Pa. Additional buildings have been erected and necessary equipment for the manufacture of malleable iron castings has been installed. The present capacity of the plant will be about 15 tons a day and the new company expects to get in operation on February 27. M. Schwendner is president and Edwin C. Donaghy, secretary-treasurer of the company, which has its Philadelphia office at 421 Arcade Building.

Bids will be received by the Borough Clerk, Coraopolis, Pa., until March 1 for furnishing one 1,500,000-gal. triplex pump; one 150-hp. gas engine; two 225-hp. gas engines,

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direct connected to 175-k.v.a., 2300-volt, 60-cycle, 3-phase alternating current generator; one 75-hp. gas engine, direct connected to 50 k.v.a.; two 175-k.v.a., 2300-volt, 60-cycle, 3-phase alternating current generator, complete with exciters; one 50-k.v.a. and one 5-panel switchboard.

Toronto

TORONTO, February 11, 1911.

Business appears to be more active than it was a year ago, while the outlook is regarded as very satisfactory, and by some dealers and manufacturers is considered to be exceedingly bright. A noteworthy phase is the establishing of warehouses in the West. This is the sequel to the excursion made through the West last summer by the Canadian Manufacturers' Association. The lesson of that trip was that to get the largest benefit of the expanding demand there and to cope with American competition, it is necessary to have warehouses at each of the important centers for the carrying and speedy distributing of stocks. This building of Western warehouses by Eastern manufacturers is a distinctive and outstanding feature of present day trade adaptation. While it is the general opinion that Canadian Western trade will this year be greater than ever, it is also realized that the struggle for it will be keener. The plans of many eastern Canada manufacturers in respect to the Western trade have been sharply changed since the reciprocity agreement was announced. A more pushing campaign will be carried on for the sale of Canadian articles. There is a feeling that a 50 per cent. preference on British goods will develop a more spirited competition on the part of manufacturers in the United Kingdom. Assuredly the saturating point of the Western demand will be higher up the scale than it was last year.

The Saskatchewan Flour Mills, Ltd., Moose Jaw, Alberta, has decided to increase its flour manufacturing capacity from its present limit of 1600 bbl. per day to one of 3000 bbl., and to build an oatmeal mill to turn out 600 bbl. per day.

Application has been made to the Dominion Government by the City Council of Edmonton, Alberta, for power grants at Grand Rapids, on the Athabasa River. It is intended to build works for the development of possibly 60,000 hp. by the municipality.

J. Larne McGibbon, president of the Consolidated Rubber Company of Canada, has acquired control of Ames-Holden, Ltd., and the James McCready Company, large manufacturers of boots and shoes in Montreal. Four million dollars is named as the sum required to bring the two companies into this merger. J. L. McGibbon says that he will introduce many new methods of manufacture into the shoe business. Two new factories are to be built. The policy followed by the New England makers will be adopted.

Directors of the Western Steel Corporation are reported by British Columbia newspapers as saying that they have taken up their option for the $500,000 site selected for a steel plant and town site on the southern bank of the Fraser River. It is added that iron ore and coal lands on Graham Island have also been acquired.

The Canadian Pacific Railway Company has let a contract for the construction of a dam on the Bow River at Bassano, Alberta. It is to be used as part of the company's irrigation works. It is stated that 2500 men will be employed on the dam. Janse, Macdonell & Co. have the contract for the excavation work, and Walker, Fyshe & Co. for the concrete work.

The Canadian Pacific Railway Company has plans for the building of a large roundhouse in London, Ont., in the spring. The machinery to be installed will be worked by power obtained from the city's distribution system.

The City Council of Calgary, Alberta, has decided to spend $38,520 on a new fire station, $13,000 for an aerial motor truck, $10,000 for a motor engine and $13,000 on other fire equipment.

Mining operations are expected to begin on a large scale in the spring in the Fort George district of British Columbia.

Many factories in Hamilton and Brantford, Ont., were temporarily incommoded by trouble at the power house of the Cataract Company's power house at De Cew Falls this week.

A large electrical equipment house in England, which got many of the contracts for motor installations in connection with the hydroelectric system of Ontario, is reported to be seriously considering the establishing of a branch plant in London, Ont.

The Cotton Print Company, a new corporation with a capital stock of $800,000, is to build a large plant at St. Timothy, Montreal. It is said that the machinery is already ordered.

At the annual meeting of the Northern Navigation Company, Toronto, it was announced that another large passenger vessel will be added to the fleet.

One hundred cars of iron pipe for the carrying of natural gas from Merlin, Ont., to London, Ont., are scattered along the line of railroad between these two points. The work of laying this pipe will be begun as soon as the frost is out of the ground.

Two of the three big dams now being constructed by the Dominion Government for conservation purposes on the Ottawa River will be completed this summer. These are the ones at the Kippewa and Temiskaming lakes. The one at Quinze Lake will be completed next winter. After their regulating influence is established water power and hydroelectric power users on the Ottawa will no longer be troubled by low water.

The Board of Control, Hamilton, Ont., opened the tenders for supplies on February 9 and awarded the contracts, with considerable partiality to local manufacturers. The Gartshare-Thompson Company's tender for cast iron pipe was $3 a ton higher than that of the lowest tender of an American company, though carrying charges, &c., would reduce this difference to $1 a ton. The Gartsshare-Thompson Company got the contract. The Toronto & Hamilton Sewer Pipe Company has not yet got the contract against an American company that bid lower, but the chances seemed to be in its favor up to the time it was decided to leave the question to be reported on by the City Engineer and one of the Controllers. The Reinforced Concrete Company, Jackson, Mich., got the contract for the 78-in. concrete pipe at $7.22 per foot. The Hamilton Foundry Company got the contract for castings, at $1.95 per 100 lb. The Canada Cement Company got the cement contract for $1.48 per barrel.

The Fire & Light Committee of the City Council of Guelph, Ont., has gone to Lansing, Mich., and other United States points for the purpose of deciding whether motor engines and other suggested fire plant equipment shall be purchased.

The Winnipeg Electric Railway Company has awarded to the Canadian General Electric Company, Petersborough, Ont., the contract for the plant of its new power station. The installation is to be of four units of 3000 kw. each.

Twenty-seven carloads of farm machinery are to be shipped over the Temiskaming & Northern Ontario Railway into the clay belt of Northern Ontario in the spring.

Much is heard these days of alleged statements of owners of American manufacturing plants in Canada to the effect that, had they foreseen the reciprocity agreement, they would not have located on this side of the boundary line.

Canadian Motors, Ltd, Galt, Ont., incorporated with $250,000 capital stock, advises that it is occcupying temporary quarters at present, but that it will erect suitable factory buildings during the coming summer for the manufacture of two lines of cars, including a two passenger roadster and a five passenger tourist.

New England

BOSTON, MASS., February 14, 1911.

General conditions continue to develop signs of improvement and tangible evidences of better business are being felt in many lines. The supply trade is good. One of the dealers found January within a few per cent. of a record. The woolen industry is reviving gradually after a long period of slackness. The railroad earnings of the New York, New Haven & Hartford and the Boston & Maine systems, which serve a very large percentage of the New England territory, indicate a considerable increase in goods hauled. One of the best features of the situation is the practically unanimous opinion that improvement will be felt from now on, most observers basing their judgment or personal experiences in their own lines of trade. The foundries are somewhat more active than they have been.

The S. A. Woods Machine Company, Boston, Mass., manufacturer of wood planing machines, will build a new power plant, from plans by Charles T. Main, Boston. A 200-kw. Rice & Sargent engine has been ordered from the Providence Engineering Works, Providence, R. I. The remaining equipment has not been purchased, including two boilers and a lighting plant. The building will be located on Old Colony avenue, adjacent to the present shops. Pains have been taken in securing a handsome architectural design, with a tower clock as a feature. In fact the power house, according to the general plans, will constitute the original unit of a group of new buildings, corresponding with it in design. The building will be large enough to permit of a duplicate power set when the need of it shall be reached.

The new round house of the New York, New Haven & Hartford Railroad at New Haven, Conn., will contain a large machine shop, for which between $20,000 and $30,000 worth of machine tools will be required late in the present year.

The Westfield Foundry & Valve Company, Westfield, Mass., will erect a foundry, 60 x 70 ft., of reinforced concrete, for the manufacture of gray iron and brass castings and valves. The company will act as designer and maker

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of special valves. C. O. Churchill is the president and secretary, L. Holst, vice-president, and R. H. White, treasurer. The capital stock is $55,000. The equipment has been purchased.

The business of C. L. Barker, Norwalk, Conn., will hereafter be operated in two departments, one for the manufacture of gas engines, the other for the building of the Murray motor truck. Plans are being made for an addition to the plant, consisting of a building 30 x 140 ft. The motor truck is the design of Arthur T. Murray, who for six years has been with the mechanical and drafting departments of the Locomobile and Lozier companies.

The business of the Porcupine Boiler Company, Bridgeport, Conn., has been incorporated in Connecticut with $23,000 capital stock, the incorporators being John K. Williamson, Arthur M. Marsh and David S. Day, all of Bridgeport. The company manufactures horizontal tubular boilers, Williamson's combination water arch and feed water heater, stacks, tanks and general iron work. The business was formerly conducted as the Hazelton Boiler Company, Rutherford, N. J., and removed in 1903 to Bridgeport.

A. E. Greene, recently with the New Departure Mfg. Company, Bristol, Conn., as superintendent of construction and motor power, has opened an office at 60 Prospect street, Hartford, Conn., as an engineer, with factory building and equipment as his specialty.

The Navy Department has given the Lake Torpedo Boat Company permission to build the $450,000 submarine cruiser for which the company has the contract, at Bridgeport, Conn., where the facilities of the plant have now been declared satisfactory by a government board. The works have been improved greatly of late, and the expectation is that their development will proceed rapidly under the new conditions.

The New York, New Haven & Hartford Railroad will erect a union station at New Haven, Conn., to cost $1,500,000. The requirements for various kinds of power and other equipment will be large.

The Auto Safety Crank Company, Holyoke, Mass., has been incorporated, with capital stock of $10,000, and will manufacture automobile specialties at Holyoke. J. L. Beck is the president and George W. Parker treasurer, the third director being J. L. Perkins. The company has not completed its manufacturing plans.

The Trumbull Electric Mfg. Company, Plainville, Conn., states that the machinery requirements for the large factory additions, contracts for which have been placed, have not been laid out, and that it will be some time before the list is ready. The company manufactures electrical supplies. It has voted to increase its capital stock from $100,125 to $500,000. The board of directors has been increased from three to seven, the new members being Andrew J. Sloper and J. E. Cooper, New Britain, and Carl W. Jones and Stanley S. Gwillim, Plainville, the old directors being John H. Trumbull, the president; Frank T. Wheeler, vice-president, and Henry Trumbull, secretary and treasurer.

The United States Motors Company has decided to abandon the Alden Sampson plant at Pittsfield, Mass., and will concentrate both the light and the heavy truck departments at Detroit, Mich., where the machinery of the Pittsfield works is being moved. The announcement had been made that the heavy truck business established by the Sampson Company would be made the nucleus of this department, and would be developed at Pittsfield, but the company found it difficult to secure skilled men in that place, and the site of the shops did not permit of extensive enlargement.

The Housatonic Power Company will triple the producing capacity of its plant at South Norwalk, Conn., by the installation of water gas apparatus and will extend its mains to New Canaan, Conn.

The Boston Machinery Company, Boston, Mass., has been incorporated with a Massachusetts charter, and authorized capital stock of $100,000. The incorporators are Richard J. Cotter, Judson A. Crane and Edward A. Taft, Jr., 84 State street. The company owns patents covering textile machinery, which will be the product. The locations of the works has not been decided.

The Boston Industrial Development Company, which is closely associated with the Boston Chamber of Commerce, has petitioned the Massachusetts legislature for a charter, the purpose being to assist financially new and promising industries, and those which, already established, are in need of cash assistance in order to develop normally. The Chamber of Commerce believes that a great good can be accomplished in this manner by establishing manufacturing concerns within the limits of the city, especially such concerns as can advantageously conduct their business in so-called loft properties. The idea is to make $25,000 practically the outside limit of assistance to individual concerns. The subscribers to the movement as members of the corporation will act to guarantee credits up to some $500,000. Similar organizations have worked with great benefits to other American communities.

The Bridgeport Metal Treating Company, Bridgeport, Conn., has been incorporated under Connecticut laws with $10,000 capital stock. W. B. Lasher is the president, W. T. Gibson, vice-president, and H. S. Brown, secretary and treasurer. The factory will be at 125 Stratford avenue. The work will consist of case hardening, heat treating and annealing, a specialty being made of high speed and tool steel hardening. The company will also have facilities for light manufacturing.

The Grand Trunk Railroad announces that the building of the extension of its allied line, the Vermont Central, from Palmer, Mass., to Providence, R. I., will begin in the spring, with the intention of having this new and important link in the system in full operation within two years. The last obstacle to the plan has been removed by the authorization by the Vermont legislature of the building of a section of railroad between Brattleboro and Windsor, Vt., a distance which the Vermont Central now traverses on tracks of the Boston & Maine.

The Standard Machinery Company, Providence, R. I., has brought out a combination press installation consisting of three presses mounted on one bed, the outboard machines being adjustable for center distances. The purpose is to handle long work which cannot be taken care of in a gang press.

The Arnold Print Works, North Adams, Mass., is planning a new weave shed containing 43,000 sq. ft. of floor space and an addition to the picker room. The Farr Alpaca Company, Holyoke, Mass., proposes to extend its weave shed, to double its capacity.

The Everett Mills, Lawrence, Mass., has issued a list of 17 machines, orders for which will be placed as soon as possible. James I. Milliken will purchase the equipment. The list follows:

One 28-in. upright drill with back gears, positive feed and automatic stop, also wheel feed, sliding head and quick return.
One engine lathe, 26-in. swing, bed long enough to allow 20 ft. between centers, compound rest, taper attachment, power cross feed, traveling rest for shafting turning, hollow spindle, center rests, &c.
One 30 x 30 in. by 10 ft. open side planer, with cross and side feed, modern in all ways.
One pipe machine to cut from 1 to 6 in., with all modern attachments, left-hand, dies 1 to 1½ in. Or two machines—one 1 to 2 in., and one 1½ to 6 in.
One 24-in. engine lathe, 12-ft. bed, hollow spindle, taper attachment, compound tool rest, back rest, face plates, &c.
One 16-in. shaper, for heavy duty, back geared, furnished with vise, outer support for table opening under ram to admit shafting to 3 in.
One 20-in. engine lathe, with compound tool rest and back rest, hollow spindle.
One combination saw table with cutting-off and splitting saw, adjustable table (and so that molding tools may be used, if practicable).
One 36-in. band saw, with tilting table so any angle may be cut.
One turret bolt cutter, to cut from ⅝ to 1½ in., with adjustable dies.
One 22-in. upright drill with back gears, positive feed and automatic stop, quick return, sliding head, &c.
One 28 x 48 or 28 x 57 in. swing gap engine lathe, with 10 ft. bed, large and small face plates, 48-in. independent jaw, chuck, compound tool rest, power cross feed, center rest, hollow spindle.
One modern traverse drill, or boring machine with power feed and of medium size for general shop work, bed about 12 ft. long.
Drill, reamers and arbors.
One modern gear cutter for general shop use.
One wood boring machine.
One mortising machine for wood.

Cleveland

CLEVELAND, OHIO, February 14, 1911.

The feature of the local machinery market the past week was a marked improvement in the volume of inquiries. While all of these are for small lots of tools, in the aggregate they amount to considerable prospective business. They have given the market a better tone and dealers are confident that the market will show considerable improvement from now on, although buyers as yet are showing some hesitation about placing orders. While actual orders during the week were not large the market showed some improvement over the previous week. Orders were mostly for single tools and small lots in small and medium sizes. Business with many manufacturers in metal working lines shows some improvement and this is having a stimulating effect on the market, bringing out inquiries from buyers who have been holding off until the business outlook was more favorable. Local machine tool builders also report an improvement in inquiries.

In heavy handling machinery inquiries are more plentiful and some business that has been pending will probably be placed shortly. The demand for water wheels is fairly active. Orders for mining machinery show an improvement. The foundry trade is still somewhat quiet, but the demand for light gray castings shows an improvement.

The Pennsylvania Railroad has received proposals for ore handling machinery to be erected on its new dock in Cleveland, and it is expected that the contract will be placed

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shortly. A large amount of preliminary work in the way of filling in the west breakwater, where the dock will be located, has already been done, and the work of erecting a concrete dock will be started early in the spring, this contract having been let to the Great Lakes Dredge & Dock Company. It is the intention to start with a capacity of 5,000,000 tons of ore per annum, room being provided for gradually increasing this to 8,000,000 tons. It is planned to have it ready for operation at the opening of navigation in 1912.

The Bingham Mfg. Company, Cleveland, recently incorporated, with a capital stock of $25,000, has established a plant at 227 Prospect avenue, N. W., for the manufacture of carbureters, spark plugs, gasoline strainers, compensators and other automobile accessories. All of the machinery equipment needed for the present has been installed. H. Bingham is treasurer, secretary and manager.

The Superintendents' & Foremen's Club of Cleveland will hold a midwinter carnival at Trostler's Academy, East Fifty-fifth street, March 1. A vaudeville entertainment, dancing and other amusements and refreshments will be provided.

The annual meeting and banquet of the Cleveland branch of the National Metal Trades Association will be held at the Hollenden Hotel March 2. Speeches will be made by Hon. W. T. Smith of Marion, Ohio, a member of the Ohio Legislature, on "Legislation," and by Dr. W. A. Knowlton of Cleveland and others.

The Wise Furnace Company, Akron, Ohio, has purchased a three-acre building site on which it will erect an up-to-date manufacturing plant, plans for which are under way. The plant will include a factory building, machine shop and warehouse.

The Lewis Electric Welding & Mfg. Company, Toledo, Ohio, has been incorporated with a capital stock of $10,000 to manufacture mechanical and electrical appliances. The incorporators are G. L. Lewis, Frank W. Otis, Ewald Preus, H. W. Fraser and E. J. Marshall.

With a capital stock of $50,000 the Bremen Mfg. Company, Bremen, Ohio, has been incorporated to manufacture hot air pumping engines. The incorporators are A. F. Turner, J. F. Purvis, H. M. Shelhamer, P. D. Turner and H. E. Young.

The Burt Mfg. Company, Akron, Ohio, has received an order from the Charlton Mills, Fall River, Mass., for 30-in. double damper ventilators designed especially for weave shed purposes. The ventilators will be made of copper. This company is now figuring on some other large contracts.

The Board of Control, Canton, Ohio, has awarded a contract for a 2,000,000-gal. triplex pump for the new auxiliary pumping station to the Deane Steam Pump Company of Indianapolis at a cost of $4020.

The Arch City Foundry Company, Columbus, Ohio, has been incorporated with a capital stock of $10,000 by W. H. Jones, R. W. McCoy, N. F. Ustick, L. V. Colbert and R. E. Pfeiffer.

The Warner Mfg. Company, Toledo, Ohio, recently incorporated with a capital stock of $500,000, will shortly announce plans for a new plant. The company, which makes gears and other automobile parts, now occupies one of the buildings of the Willys-Overland plant.

The Wadsworth Core Machine & Equipment Company, organized by George H. Wadsworth, recently superintendent of the Falls Clutch & Machinery Company, Cuyahoga Falls, Ohio, has been incorporated with a capital stock of $15,000. The company will start a plant in Akron, Ohio, about March 1. No new equipment will be required.

Indianapolis

INDIANAPOLIS, IND., February 14, 1911.

The Chandler-Taylor Company of this city, manufacturer of boilers and engines, has received an order for a power plant from Venezuela.

The American Die Castings Company, Indianapolis, has increased its capital stock from $3000 to $36,000.

The Royse Electric Company, Indianapolis, has changed its name to the Indianapolis Electric Supply Company and has increased its capital stock from $60,000 to $70,000.

The Tiebert Gas Engine Company, Butler, Ind., has increased its capital stock from $20,000 to $40,000.

The Crescent Electrical & Mfg. Company, Valparaiso, Ind., has changed its name to the Crescent Company. The company has issued $20,000 of preferred stock.

The Hoosier Account Register Company, Noblesville, Ind., has been incorporated, with $40,000 capital stock, to manufacture cash registers and similar articles. The incorporators are John C. Jones, J. C. Craig and A. W. Truitt.

The merchants of Princeton, Ind., have decided to join the Commercial Club of the city in special efforts to induce the location there of small factories, giving them sites, but not bonuses.

The Nye Gas Machine Company, Laporte, Ind., has been incorporated, with $75,000 capital stock, to manufacture gas machines. The directors are John R. Nye, H. B. Johnston and C. F. Peterson.

The Kells Foundry & Machine Company, East Gary, Ind., has been incorporated, with $40,000 capital stock, to do a foundry and machine business. The directors are George Earle, William Earle and C. W. Barnes.

The Danziger Furniture Company, Shelbyville, Ind., has been incorporated, with $30,000 capital stock, to manufacture furniture. The directors are Gustav Danziger, A. E. Spiegel and C. A. Spiegel. The last named is president.

The O'Neill Bottle Machine Company, Terre Haute, Ind., has been incorporated, with $10,000 capital stock, to manufacture bottle-making machinery. The directors are F. O'Neill, A. L. Pfau and I. W. Richardson.

The S. G. Taylor Chain Company, the principal industry of Maxwell, Ind., is being moved to Hammond, Ind.

The property of the Union Gas Light & Fuel Company at Anderson, Ind., has been sold at receiver's sale to C. W. Hooven, for $200,000. The name has been changed to the Anderson Gas Company, with $200,000 capital stock, and with Clement W. Hooven, Joseph H. Millspaugh and H. L. Millspaugh as directors.

The Kelly Foundry Company, Elkhart, Ind., has been incorporated, with $10,000 capital stock, to do a general foundry and machine business. The directors are A. Sorge, Jr., Edward Kelly and John Kelly.

The Braden Mfg. Company, Terre Haute, Ind., has purchased a site on which it will erect a new factory building, 60 x 275 ft., two stories, early in the spring. W. E. Williams, manager of the company, has just been granted a patent for a comb cover design for corrugated roofs. The company is also preparing to manufacture, in addition to the products already provided for, stock tanks, steel ceiling and other material of like nature. The plant will be equipped with new machinery throughout. It is the intention of the company to install a roll corrugating machine and a drop press for steel ceiling work.

St. Louis

ST. LOUIS, February 13, 1911.

There seems to be unmistakable signs of better business. Concerns that have not been buying recently are now coming into the market to some extent. The hope is expressed generally that the improvement may be along conservative lines and anything in the nature of a boom avoided. Most dealers would rather see a more moderate movement, if steady, as better results can be secured per effort expended at such times.

The Aluminum Company of America is making some rather extensive additions to its plant in East St. Louis.

Work is rapidly progressing on the drainage proposition designed to protect East St. Louis against ravages by river overflows. Several big steam ditch diggers are constantly at work.

The Landis Machine Company, maker of harness and shoe sewing machines, has its large plant crowded with work and finds it very difficult to meet its orders with satisfactory deliveries.

The C. Hagar & Gay Hinge Mfg. Company, St. Louis, finds business good and the outlook satisfactory. About six months ago the new addition to its plant, a two-story brick building, was completed, which was rendered necessary by the expansion in its business.

The St. Joseph Terminal Company, St. Joseph, has let the contract for a large ice house to be built at Lake Contrary.

The Fulton Iron Works, St. Louis, Mo., has sold the property on which it is now located to the Chicago, Burlington & Quincy Railroad and will move to a new site of about 8 acres on the outskirts of the city, where it will erect a plant involving an investment of about $350,000. The new plant will include a machine shop, 400 ft. long with 75 ft. center span and two bays of 45 ft. each; a foundry, 250 ft. long, with 75 ft. and a 40-ft. bay; necessary power house, pattern shop, storage, &c. Plans are now being prepared and the company expects to close contracts within the next 30 days. The plant when completed will contain the most modern equipment, all of which will be electrically driven.

The Star Bucket Pump Company, St. Louis, is having plans prepared for a new factory building 64 x 125 ft., three stories and basement.

The Anheuser-Busch Brewing Association, St. Louis, Mo., has plans prepared for a wagon factory, 60 x 163 ft., four stories.

The plant of the Henry Quellmalz Lumber & Mfg. Company, on Second street, St. Louis, was damaged by fire February 9 to the extent of $10,000. The loss is fully covered by insurance.

The Chemical Floor & Tile Company of Missouri has

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been incorporated with a capital stock of $150,000. The incorporators are Daniel F. Rose of Little Rock, Ark.; Edward P. Weilms, Daniel F. Rose, Jr., and others. The company will engage in the manufacture and installation of floors.

The Steinhauer Truck & Motor Car Company, St. Louis, has been incorporated with a capital stock of $250,000. The incorporators are Peter P. Probst, William Fraeckenschmidt, Alonzo Dryer, John W. Wright and others. The company will engage in the manufacture of vehicles, automobiles, &c.

The Goss-Acrey Calculator Company of St. Louis has been incorporated with a capital stock of $100,000. The incorporators are W. B. Acrey, B. L. Acrey, George W. Goss and others. The company will engage in the manufacture of calculating machines.

The Automatic Register Company, Dover, Del., which recently purchased all patents, machinery, stock and other assets of the American Fare Register Company of St. Louis, has secured a long term lease upon the first floor of the Metropolitan Building, Fifth and Missouri avenues, East St. Louis, Ill., and has equipped its plant with the latest improved machinery. This company owns several patents on certain automatic passenger recorders which it is manufacturing for the various railroad companies. The company has a capital stock of $1,000,000. Adolphus D. Branham of Virginia; Judge William P. Launtz, city attorney for East St. Louis, Ill.; Paul W. Abt, vice-president Illinois State Trust Company, East St. Louis, and Ernest Lane, Springfield, Ill., own the controlling interest.

Detroit

DETROIT, MICH., February 14, 1911.

No one city in the United States profits more from the several automobile shows than Detroit. Practically every make of motor cars manufactured in this city is represented at each exhibition, and the thousands of dollars' worth of orders resultant upon each show practically means the life of the concerns. The manufacturers of the commercial cars profited wonderfully from the recent Chicago show. Each concern has booked sufficient orders to practically run the plant for the balance of the season. While the commercial cars were well treated at the New York show, they did not make anywhere near the record they attained at the Chicago show. During the past week, two new automobile companies joined the ranks of this city's long list of motor car manufacturers, which goes to show that no slump is anticipated in the prosperous market conditions.

Details were arranged this week for the organization of a new company with a paid up capital stock of $12,000, to be known as the Collapsible Shipping Case Company. The company is formed to sell and manufacture a knockdown shipping case, adaptable to a variety of uses, which is the invention of Martin P. Connoly of Wayne.

Bay City, Mich., will vote on a $600,000 bond issue to defray the expenses of the construction of a modern water works plant. The Charter Revision Committee has recommended that the question be voted upon at the spring election.

A business deal of prime importance to the little city of Union City, Mich., is the consummation of the Union City Mills by the firm of Randall Brothers. The new company will at once expend $10,000 in improving the water power and buying new machinery for custom and flour manufacturing.

A preliminary organization, with a capital stock of $100,000, has been effected at Traverse City, Mich., for the manufacture of aeroplane engines. An engine, claimed as absolutely reliable by its inventor, a local man, will be the product of the company.

A new steel ice breaker for the Straits of Mackinac, intended to replace the old Ste. Marie, will shortly be ordered, according to advises from St. Ignace, Mich. The new vessel will be 125 ft. longer than the old boat, and is to be designed after the Baltic service boats of the Russian Government.

In line with many improvements which have been made by the Michigan United Railways Company during the last few months, it is now announced that the company is considering the advisability of installing its own power plants. Engineers are at present making the necessary observations.

The Detroit Wheel Company, with a capital stock of $1,000,000, was incorporated in Lansing, Mich., this week. The company will manufacture a new spring tire wheel, designed by the inventor, Charles R. Chisholm, to replace the pneumatic tires. The incorporators are planning the construction of a large plant.

The King Motor Car Company, composed of principally Detroit and Cleveland capital, is the name of a new automobile concern of this city. The company has a capital stock of $500,000 and will manufacture a 30-hp. car that will have only about 450 parts. The average automobile has between 1500 and 1600 parts.

The Great Western Smelting & Refining Company, Detroit, Mich., which suffered severely in the fire that destroyed an eight-story building at Woodbridge and Bates street last week, has opened new office and warehouse quarters at 12 Atwater street.

The Bolton Automobile Company, Saginaw, Mich., has filed articles of incorporation. The company will operate a garage, salesroom and repair shop, installing the most modern machines and garage conveniences.

The B. F. Freeland & Sons tank factory, at Sturgis, Mich., was totally destroyed by fire on February 7. The loss will amount to nearly $50,000, with about $11,000 insurance. Another plant will be constructed immediately.

The Muskegon Boiler Works, Muskegon, Mich., is giving indications of great expansion. It recently sent a crew to Pearson, Mex., to erect a plant for the Madeira Company, while another crew has been sent to Big River, Saskatchewan, Canada, to erect a complete boiler equipment for the Big River Lumber Company.

The National Window Weight Company, Detroit, has incorporated with a capital stock of $30,000.

By the installation of additional machinery the Northern Michigan Brick & Tile Company, Reave, Mich., is preparing to largely increase the capacity of its plant.

The Hastings Motor Shaft Company, Hastings, Mich., has increased its capital stock from $30,000 to $50,000. The increase is primarily for the purchase of new machinery, the present plant being inadequate for their rapid growth.

Charles J. Stroebel and Stanley Vaughan, both of Toledo, have picked Detroit as the location of the plant of the International Aviation Company. The concern has a capital stock of $100,000 and plans to erect the factory near Grosse Pointe, Mich.

The Chief Motor Car Company is the latest automobile concern for Detroit. The company will manufacture an eight-cylinder car, with a detachable body, which can be used for both pleasure and commercial purposes.

The Gray Hawley Mfg. Company, Detroit, has purchased a new factory site on West Jefferson avenue, 55 x 200 ft. Ground has been broken for a two-story factory and office building, to cost in the neighborhood of $25,000. Its product is brass specialties for motor cars and motor boats.

President Homer Warren of the Warren Motor Car Company, Detroit, announces that work will soon be begun on a second new factory building for the company. The building will duplicate the present one.

Articles of incorporation have been forwarded to Lansing by the Detroit Foundry & Mfg. Company. The company has a capital stock of $50,000, and will manufacture brass and aluminum castings.

The Auto Parts Mfg. Company, Detroit, Mich., has increased its capital stock from $100,000 to $250,000, and has purchased the entire plant formerly occupied by the C. D. Widman Company, which gives it an increase of approximately 64,000 sq. ft. of floor space, and enough land to provide for such buildings as it may desire to erect.

The Battjes Fuel & Building Material Company, Grand Rapids, Mich., is constructing a foundation for the erection of a large gravel washing and screening plant at Lamar, Mich., where it owns extensive gravel property. The gravel will be handled from the pit by a steam shovel and from a hopper will drop upon a 24-in. belt conveyor to be hoisted to the top of a 60-ft. tower. From the belt the gravel will drop to the screens, where it will be washed by a stream of water from a pump, with capacity for 300 gal. per minute. The gravel, after lodging in four compartments, according to grade, will be loaded on cars or wagons by opening chutes in the sides. The stones will be carried by belt conveyor back to the starting place and hoisted to a crusher for grinding, after which they will be graded like the gravel. Plans for the plant are being prepared by J. C. Buckbee & Co., Chicago.

The Michigan Pressed Steel Company, Detroit, Mich., which a few weeks ago moved into its new plant in that city from Ypsilanti, is contemplating further additions and extensions in the spring. The company manufactures sheet metal parts for agricultural machinery and implements. The first new building will be a warehouse; later in the year a shop will be added.

Milwaukee and the Northwest

The American Grinder Mfg. Company, Milwaukee, Wis., has increased its capital stock from $5000 to $10,000.

The Nortmann-Duffke Foundry Company, Milwaukee, has completed an addition to its plant and is now doing a general jobbing business in perforated metals in conjunction with its pressed steel and foundry business. The company has all the machinery needed at present, but will be in the market in the near future for additional perforating machines and a 60-in. shear for one-fourth in. metal.

The United States Glue Company, Milwaukee, has under

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construction a cook house and two or three smaller buildings, of mill construction.

The I. B. Rowell Company, Menominee Falls, Wis., contemplates the erection of additions to its plant in the spring, details of which have not been decided upon.

The American Seating Company, Racine, Wis., advises that the matter of erecting new buildings and improvements for the coming year is held in abeyance pending a report from the executive committee.

A company has been incorporated at Merrill, Wis., with $75,000 capital stock, for the purpose of establishing a veneer factory, work upon which will be commenced at once. Details of equipment to be purchased have not been decided upon. The officers of the company are: L. G. Leidiger, president; F. W. Olhoff, vice-president; W. A. Runge, secretary and treasurer.

The Gould Mfg. Company, Oshkosh, Wis., has increased its capital stock from $100,000 to $200,000.

Bonds have been voted by Stoughton, Wis., to improve the municipal light and power system.

The Schmit Brothers Trunk Company, Oshkosh, Wis., is considering the construction of a dry kiln, 20 x 40 ft., of wood and iron sheeting construction, with concrete foundation.

The Manitowoc Boiler Works Company, Manitowoc, Wis., has under construction an addition to its plant, to be used for housing its lap welding machines.

The S. Freeman & Sons Mfg. Company, Racine, Wis., is contemplating the erection of an addition to its foundry, details of which have not been determined upon.

The Rhinelander Refrigerator Company, Rhinelander, Wis., is completing a fireproof addition, 70 x 150 ft., three stories and basement, and is in the market for fireproof sash frames and a sprinkling system.

The Flambeau Paper Company, Park Falls, Wis., will install a new paper machine and a new battery of boilers. With these changes the company's mill will be operated entirely by steam, thus enabling it to use its water power for grinding pulp.

The Twin Falls Land Company, D. W. Mead, consulting engineer, Madison, Wis., is building a dam on the Menominee River in the vicinity of Iron Mountain, with the intention of installing a hydroelectric power plant.

The Holbrook-Armstrong Iron Company, Racine, Wis., has increased its capital stock from $150,000 to $300,000.

The Jewel Gas Company, Aberdeen, S. D., is being organized with $25,000 capital stock to manufacture the Jewel gas machine. It is the intention of the company to erect a factory which it will equip with modern machinery. A washing machine will also be manufactured. J. H. Regan is president and general manager of the company.

Texas

AUSTIN, TEXAS, February 11, 1911.

Industrial and business conditions generally all over Texas and in a big scope of territory of Northern Mexico have been brightened during the last few days by general rains. In some sections the precipitation was greater than for many months, and the drought is believed to be completely broken. Growing grain was greatly benefited, and the ground was placed in prime condition for planting.

The El Paso Electric Company, a subsidiary of the Stone-Webster syndicate of Boston, Mass., will spend about $200,000 in making extensions of its electric railway system at El Paso, Texas, and for other improvements.

The Farmers' Union Ginning Company, Taylor, Texas, will erect a cotton gin at a cost of $25,000. Richard A. Bradford of Taylor is among those who are interested in the project.

The American Sugar Refining & Mfg. Company, which has entered into a contract for the erection of a beet sugar factory at Portales, N. M., to cost more than $1,000,000, has under consideration the project of erecting a similar factory at Pecos, Texas. It is stated that if the farmers of the lower Pecos River valley will guarantee to raise a sufficient quantity of sugar beets to supply the proposed factory it will be erected.

A factory for the manufacture of leather goods will be established at Taylor, Texas, by Madison & Co., St. Louis, Mo.

Preliminary plans have been adopted for the construction of a system of sewers for Cuero, Texas. The matter is in the hands of the Commercial Club of that place.

The Morris Packing Company has purchased a site for a proposed meat packing plant, which it will erect in San Antonio, Texas. The building will be a three-story brick, with basement.

J. E. Brown and W. D. Kyser have been granted a franchise by the City Council of Marlin, Texas, for the construction of a water works plant and distributing system.

H. T. Lawler and J. T. Lawler of New Orleans, La., who are arranging to establish a flour mill at Bryan, Texas, with a 200-bbl. daily capacity, have entered into a contract with the City Council of the latter place to furnish electric power and lights for the town.

A site has been selected for the proposed garbage disposal plant, which the City Council of Marlin, Texas, will install.

Dr. W. W. McVea and associates of Yoakum, Texas, are arranging to construct a sewer system at that place.

The Weimer Ice & Cold Storage Company has been formed, with a capital stock of $12,000, for the purpose of installing an ice and cold storage plant at Weimer, Texas. Charles Fahrenthold is president; Frank Anders, vice-president; George Heider, Jr., treasurer, and Oscar Boettcher, secretary.

Drainage pumps of large capacity will be installed upon a tract of 17,000 acres of land near Orange, Texas, which was recently purchased by J. J. Schult of Madison, Wis., and associates. A system of drainage canals and ditches will also be constructed upon the property.

An election has been ordered for March 25 by the City Council of Brady, Texas, to vote on the proposition of issuing $40,000 of bonds for extending and improving the water works plant and distributing system. Dams will be constructed across Brady creek to form water storage reservoirs and a new pumping and filtration plant installed.

The Valley Reservoir & Irrigation Company, which is constructing a large system of irrigation in the lower valley of the Rio Grande, in the vicinity of Chapin, is preparing to install a pumping plant at the point on the river where the intake is located.

The Mission Farm Company will install a cotton gin at Mission, Texas. S. J. Smallwood is manager.

The Mission Canning Company is erecting a large canning factory at Mission, Texas. The machinery will soon be installed. A. H. Fisher is manager.

General Luis Terrazas of Chihuahua, Mexico, will construct a large system of irrigation upon his Torreon ranch. The surveys for a dam and proposed storage reservoir have been made by M. C. Liquornik of Chihuahua. It is planned to impound about 6,000,000 cu. meters of water. A large pumping plant will also be installed.

The Farmers' Union Warehouse Company, Taylor, Texas, will build and equip a cotton ginning plant to cost upward of $25,000 and a 500-ton seed house. J. R. Hargis is the president of the company.

The city of Bryan, Texas, has closed a deal with the present water company for its entire water distributing plant. The contract price was $12,625.

The new city of Polytechnic, Texas, will vote on a bond issue of $50,000 for the establishment of a water system.

The city of Brownsville, Texas, will vote on a bond issue aggregating $140,000, of which $35,000 is to be applied for the improvement of the water system and $15,000 for the improvement of the electric light system.

The plant of the Houston Co-operative Mfg. Company, on Naner street, Houston, Texas, was damaged by fire February 4 to the extent of $25,000. The main building suffered very little damage.

The Model Carriage Company, Houston, Texas, will move into the old Jewish synogogue, which has been purchased by the company for $22,500.

The Brenham Compress, Oil & Mfg. Company, Brenham, Texas, has let contracts for additional machinery and equipment, which will cost in the vicinity of $25,000. The contracts were awarded to the Westinghouse Electric & Mfg. Company and the Harrisburg Engine Company.

The property taxpayers of Waco, Texas, decided to issue bonds to the amount of $250,000 for the election and equipment of a municipal plant.

Farther Central West

The machine shops and equipment of the Highland Park College, Des Moines, Iowa, were totally destroyed by fire on the night of January 30. The shops were equipped with 42 engine lathes, 14 drill presses, 2 shapers, 1 Landis milling machine, 1 Landis grinder, 1 large planer and numerous other tools, none of which can be rebuilt. The college is now planning the erection of new shops, 100 x 180 ft., 50 x 80 ft. of which will be utilized as a forge room, foundry work, traction engine room, wood shop and garage for automobile work. Bids are now being received for construction of the shops and work will be commenced as soon as possible. The building will be one story, of saw tooth roof construction, and it is expected to be completed within three months.

The American Enamel Brick Company, Des Moines, Iowa, is completing arrangements for the establishment of

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a plant for the manufacture of enameled face concrete brick, which it expects to have in operation about April 1.

The Wood Brothers Thresher Company, Des Moines, Iowa, incorporated with $600,000 capital stock, to succeed the Wood Brothers Steel Self-Feeder Company, advises that it will not erect any new buildings before next September.

The Northey Mfg. Company, Waterloo, Iowa, maker of ice machines, is contemplating the erection of an addition to its plant this spring, 70 x 145 ft., three stories and basement.

Dexter, Iowa, is considering the installation of a gas lighting system at an estimated cost of $12,000.

The citizens of Zearing, Iowa, have voted to issue bonds for the establishment of a water works system.

Leroy Corliss of Omaha, Neb., will erect at Waterloo, Neb., a milk condensing plant, 40 x 150 ft., which will require an investment of $35,000. The town made a grant of a strip of land 10 ft. wide along the Union Pacific Railroad tracks for the use of the plant.

The South

LOUISVILLE, KY., February 14, 1911.

An improved demand for machinery is reported in this market, quarrying equipment especially being in good demand. Boilers and refrigerating equipment are also selling well, the manufacturers report.

The Standard Oil Company has purchased a 150-ton ice machine for use in its plant at Whiting, Ind., from the Henry Vogt Machine Company of this city.

The Master Patent Floor Company, Knoxville, Tenn., has been incorporated, with a capital stock of $60,000, by John F. Master and others. Woodworking machinery will be purchased and a plant equipped.

The Smithfield Milling Company, Smithfield, Ky., will probably purchase equipment for increasing the capacity of its steam power plant.

J. B. Wathen of Louisville has purchased the machinery of the American Piano Player Company of this city, which recently failed. The purchase price was $4000.

The Elite Laundry will erect a steel addition to its plant and probably will require some additional machinery.

The Fiscal Court has awarded a contract to Booth & Co. of New York for the installation of a water-softening plant in connection with the artesian well at the county jail. The purchase price was $2080.

The Anderson Resilient Wheel Mfg. Company has been incorporated at Nashville, Tenn. It has a capital stock of $500,000 and plans to erect a factory for the manufacture of a solid tire automobile wheel. Resilient spring spokes will be used instead. O. H. Anderson of Sparta, Tenn., invented the wheel.

The American Steel & Wire Company will erect a warehouse at Memphis, Tenn., which will be used in the distribution of its products in Southwestern territory. The company has heretofore handled about 50,000 tons through Memphis. Much of the material will be brought down the Ohio and Mississippi rivers in barges.

The annual report of the Geological Survey on Kentucky coal properties indicates that the use of machines for undercutting coal has undergone a great increase, 50 per cent. of the total output now being machine mined. Punchers and chain breast machines form the bulk of the equipment in use.

Optimistic reports were submitted at the annual convention of the Brick Manufacturers' Association of the United States in this city last week, and the outlook in the trade is good, in spite of the inroads of concrete, to combat which a publicity bureau has been organized. Great advances have been made in clay-working machinery manufacture, and electrical equipment for conveying bricks is now receiving great attention. The machinery manufacturers had numerous exhibits at the convention.

C. D. Norris, formerly with the Studebaker Bros. Mfg. Company, and now superintendent of the American Automobile Mfg. Company of New Albany, Ind., is superintending the installation of machinery in the company's plant, which will be put in operation about April 1.

The Kentucky Electrical Company, Owensboro, Ky., has received a contract for the manufacture of 104 midget flour mills from the Anglo-American Milling Company of that city. About $100,000 was involved.

The Smith Cooperage Company, Louisville, is establishing an electric light plant and ice factory at Livermore, Ky. The refrigerating equipment has been purchased from the Henry Vogt Machine Company, of Louisville, but the contract for the electrical equipment has not yet been awarded.

The water department of Memphis, Tenn., is planning the issuance of several hundred thousand dollars in bonds to provide for improvements. Additions are to be made to the pumping equipment, and many miles of mains are to be laid. A contract has already been made with the United States Cast Iron Pipe & Foundry Company for 2000 tons of pipe of various sizes. A system of feed water heaters is to be installed also. A crane is to be built for use in handling pipe and other heavy material.

The Southern Railway is experimenting with a new type of valve gear to supersede the present link motion. The new gears are said to be much more accessible than the old kind.

Machinery is being installed in a new automobile factory at Tullahoma, Tenn. A light road vehicle is to be manufactured.

The Southern Motor Works, Nashville, Tenn., will increase its capacity so as to provide for the manufacture of commercial trucks.

G. W. Setzer, who operates a machine shop at Johnson City, Tenn., is making improvements in his shop a big 12,000 planer having already been installed.

Paul M. Taylor, of Huntington, Ind., purchased at auction the gas works at Washington, Ind. It has been in the hands of a receiver for a year. The purchase price was $30,000, and the new owner will make improvements.

Oliver Moore and Grant White are planning a $10,000 flour mill to be established at Whitesburg, Tenn. Most of the equipment has been ordered.

The Appalachian Marble Company, Knoxville, Tenn., is planning the purchase of a diamond saw, polishers, planers and other stone working equipment. It is erecting a mill which will be in operation some time in March.

Woodworking and power equipment will be required by the Harriman Heading Company, which is erecting a heading plant at Harriman, Tenn.

The Lexington Machine Works, Lexington, Ky., has been incorporated, with $12,000 capital stock, and will manufacture gas engines. It is in the market for power equipment, including engines and boilers.

An ice plant will be established at Clinton, Ky., by the Clinton Water & Light Company.

Improvements are contemplated by the Richmond Electric & Power Company, Richmond, Ky., which recently increased its capital stock and is now issuing $20,000 of bonds. L. B. Herrington is president of the company.

I. H. Dungan, Humboldt, Tenn., is organizing a company which will manufacture a patented water motor. Definite plans have not yet been made regarding a plant.

A malleable iron plant will be added to the works of the William J. Oliver Mfg. Company at Knoxville, Tenn. It manufactures plows.

Electric light and power equipment will be required by the Nicholson Coal Company, Middlesboro, Ky., which will operate conveying and coal cutting machinery by electricity. J. C. Cardwell of Louisville, is president of the company.

The plants of the Clinton Iron Works and the Maryville Iron Works, at Knoxville, Tenn., have been taken over by the Knox City Iron Works, which recently incorporated. Stoves will be the principal output.

Clarence W. Howes is organizing a company which will establish an electric light plant at Paintsville, Ky.

The capacity of the sawmill of the Haskew Lumber Company at South Pittsburgh, Tenn., will be largely increased by the addition of new machinery, including rip saws and cut-offs. The power equipment will also be added to.

The Cedar City Mills, Lebanon, Tenn., is in the market for equipment for an ice factory and cold storage plant. The factory will have a daily output of 30 tons.

The Freuler Machine Works, Chattanooga, Tenn., is testing a new steam engine which was invented by George Veitsch, of Bessemer, Ala. The engine has been patented, and smaller size and weight in proportion to power than other types are claimed for it.

The Lexington & Interurban Railway Company, Lexington, Ky., will be reorganized and extensive improvements made including the erection of a new power plant at a cost of $500,000.

The Lexington Machine Works, Lexington, Ky., has been incorporated with $12,000 capital stock. The company will manufacture gasoline engines and special machinery and deal in and repair machinery of all kinds.

B. J. Robinson, Vicksburg, Miss., has plans prepared for a one-story machine shop to be constructed at a cost of $4500.

Bids will soon be opened by the city of Dothan, Ala., for the construction of water works and an electric light plant at an estimated cost of $60,000. B. R. Pilcher is the engineer.

The D. K. Jeffreys Lumber Company, Natchez, Miss., has completed a saw mill and another one will be put in operation in a short time. A third mill will also be erected by the company.

The wagon shops of Otis Smith at Hattiesburg, Miss., were destroyed by fire February 4, causing a loss of $8000, partially covered by insurance.

The saw mill of J. A. Leindecker, Coushatta, La., was burned February 3. The planing mill was saved and the saw mill will be rebuilt at once.

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The Rex Smith Aeroplane Company, Washington, D. C., has been organized, with a capital stock of $500,000, to manufacture aeroplanes and will erect a plant, 40 x 75 ft., at College Park, Md., adjoining the National Aviation Field. For the present only the usual wood working machines for sawing, planing, jointing, shaping and boring will be installed. The officers of the company are Victor J. Evans, president; Rexford M. Smith, vice-president and general manager; Hugh M. Sterling, secretary, and C. A. M. Wells, treasurer.

The American Aim & Finance Company, Fernandina, Fla., has been organized, with $1,000,000 capital stock, for the manufacture of a patented convertible street car advertising device. The company is planning for the erection of a factory equipped with the most modern machinery, work on which will begin within the next six months. The officers of the company are P. P. I. Fyfe, president; J. W. Brownfield, vice-president; W. H. Allen, secretary, and H. P. Trimble, treasurer.

Citizens of Attalla, Ala., have approved the issuance of $30,000 in bonds for the construction of a sewerage system.

The Lucas Land & Lumber Company, Paducah, Ky., has acquired the property of the Paducah Veneer Lumber Company. The company plans to make alterations to the plant and additional machinery will be installed later on, details of which have not yet been worked out.

Bonds will be issued by the citizens of Fairburn, Ga., for the construction of an electric light plant.

The city of Manchester, Tenn., is considering the question of building a water works and electric light plant. A bill has been recently introduced in the State Senate allowing the town to vote on the question of issuing bonds to cover the necessary expenses. The citizens favor giving a franchise to a corporation to put in a plant.

The Southwest

The Kansas City Terra Cotta Company, Kansas City, Mo., has plans prepared for a terra cotta plant, warehouse and kilns, 110 x 244 ft., one story.

The Consumers' Electric Light & Power Company, De Soto, Mo., will improve and increase the capacity of its plant.

The Pryor Ice & Light Company, Pryor, Okla., has been incorporated, with $50,000 capital stock. The company has just completed a new brick building, in which it is installing three new boilers of 100 hp. each, one 80-hp. engine, direct connected with 50-kw. dynamo, and a 160-hp. engine, direct connected with a 100-kw. dynamo. A contract has also been let for the installation of a 10-ton ice plant.

Lamont, Okla., will expend $20,000 for a water works system.

The Dyer Company, Cleveland, Ohio, engineer and contractor, has secured a contract for the construction in Sevier Valley, Utah, of a sugar plant for the Utah-Idaho Sugar Company. Engines and boilers to be installed have practically been decided upon and specifications for pumps have been issued to various manufacturers. The company will receive bids in about 60 days for structural material to be used in erecting the buildings.

Park City, Utah, has specifications completed for a water works system, bids for the construction of which will be asked at once.

The Degnan-McConnell Coal Company, Wilburton, Utah, has applied to the city of Heavener, Okla., for an electric light and power franchise, it being the intention of the company to erect a plant at that place.

The Arkansas Cold Storage Company, Little Rock, Ark., is having plans prepared for a cold storage plant consisting of cold storage house, 54 x 68 ft., two stories; boiler house, 28 x 45 ft., one story; engine room, 30 x 50 ft., one story; tank house, 21 x 53 ft., one story, and an office building, 16 x 18 ft., one story. Tait & Nordemeyer, Liggett Building, St. Louis, Mo., are the engineers in charge and will soon receive bids on equipment.

The laundry, power and heating plant was destroyed by fire and another will be erected at the State Deaf Mute Institution, Little Rock, Ark.

The large steam cotton gin of J. J. Farrell, Brinkley, Ark., together with all machinery, gin stands, &c., was burned February 7. The property was covered by insurance.

The Grafton Stove & Heading Company, Grafton, Ill., has purchased a tract of 51 acres in Pocahontas, Ark., and will erect a large plant for the manufacture of stoves and headings.

The Helena Veneering Company, Helena, Ark., will break ground at once for the erection of a thoroughly modern plant.

Work has commenced on the new oil refinery at Fort Smith, Ark., which is to cost about $100,000. The greater part of the building will be of steel and concrete.

The Tulsa Glass Mfg. Company, Tulsa, Okla., will make improvements to cost in the neighborhood of $250,000. The first change to the plant will be the erection of a new furnace which will be used in the manufacture of white glass globes.

The power house at the planing mill of the 'Frisco Lumber Company at Bokhoma, Okla., was burned February 3.

The National Biscuit Company, Chicago, is expected to begin the erection of a branch factory in Oklahoma City, Oklahoma, some time after March 1. The statement is made that the company has set aside $360,000 to be used in buildings in that State. It will locate warehouses in several towns.

The Central Foundry Company, which now has a small plant at 304 Northwestern avenue, Oklahoma City, Oklahoma, with offices in the Baum Building, will shortly break ground on a three-acre site along the tracks of the Missouri, Kansas & Texas Railroad in that city for the erection of a brick one-story foundry building, 50 x 150 ft., and a fire-proof pattern building, 35 x 40 ft. The company is at present making gray iron castings, but its new plant will turn out steel castings also. The principals in this company are M. K. Weigel, Garrett A. Walsh and V. L. Bath. The company has a capital stock of $25,000.

The Ozark Power & Water Company, Forsyth, Mo., has been organized to construct a hydroelectric plant on the White River. The tentative plans of the company call for a dam, 40 ft. high and machinery sufficient to develop 2500 hp. The estimated cost of the plant is $400,000. Holman & Laird, St. Louis, Mo., are the consulting engineers in charge.

The city of Chaffee, Mo., will expend $20,000 for the extension of its water works plant. Bids will be received until March 1 by M. S. Murray, Sikeston, Mo., engineer in charge.

The Canadian Power & Light Company, Okemah, Okla., has been incorporated with $100,000 capital stock to develop a hydroelectric power plant on the Deep Fork of the Canadian River. The plans of the company include the construction of a hollow concrete dam and aqueduct, with turbines developing over 2000 hp. W. H. Dill is president of the company.

The city of Cherokee, Okla., will receive bids through engineers Burns & McDowell, Kansas City, Mo., until February 25, for the installation of a direct connected 75-kw. 2360-volt, 60-cycle generator for the municipal electric light and power plant.

The citizens of Englewood, Kan., have voted for the issuance of bonds for the construction of a system of water works. J. S. Worley & Co., Reliance Building, Kansas City, Mo., are the engineers.

Bids will be received until April 20 for the construction of water works for the city of Helena, Mont., at an estimated cost of $600,000. W. Heimick is city engineer.

Government Purchases

WASHINGTON, D. C., February 14, 1911.

The Paymaster General, Navy Department, Washington, will open bids February 21 for furnishing supplies as follows:

Schedule 3310, class 81, turret turning gear equipment; class 82, one necessary variable speed power transmission apparatus.

Schedule 3312, class 84, two electric ventilating sets; class 91, four 20-hp. gasoline engines.

The Paymaster General, Navy Department, Washington, will open bids February 28, under schedule 3297, for one hollow chisel mortising machine and one vertical gear-driven gang boring machine for Mare Island, Cal., and schedule 3337, class 52, variable speed power transmission apparatus for Boston, Mass.

The Isthmian Canal Commission, Washington, circular 622, calls for gear and milling cutters and foundry core machines.

The Inspector of the third lighthouse district, Tompkinsville, N. Y., opened bids January 30 for furnishing one power mortising machine as follows: Olney & Warrin, New York, $255.56; American Wood Working & Machinery Company, New York, $214.50; Fairbanks Company, New York, $200 and $220; J. A. Fay & Egan Company, New York, $324.

The Inspector of the third lighthouse district, Tompkinsville, N. Y., opened bids January 30 for furnishing two wood boring machines as follows: Cleveland Pneumatic Tool Company, New York, $125; Chicago Pneumatic Tool Company, New York, $120; Ingersoll-Rand Company, $105.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids February 4 for furnishing one 60-ton electric traveling crane for Building No. 23, Navy Yard, Norfolk. Various alternate bids were received. The bids on the completed work are as follows:

Manning, Maxwell & Moore, New York, $15,085; Cleveland Crane & Engineering Company, Wickliffe, Ohio, $13,985, alternate for General Electric Company's motors, $12,450; Whiting Foundry & Equipment Company, Harvey, Ill., $14,445; Morgan Engineering Company, Alliance, Ohio, $14,880; Niles-Bement-Pond Company, New York, $11,965, alternate, $10,775; Alfred Box & Co., Philadelphia, Pa., $14,499; Baltimore Bridge Company, Baltimore, Md., $11,911, alternate, $10,881.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market rep

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅜ in. round and square	₩ lb 1.75¢
1½ to 4 in. x ⅝ to 1 in.	₩ lb 1.75¢
1½ to 4 in. x ¼ to 5-1	₩ lb 1.85¢
Rods—⅜ and 11-16 round and square	₩ lb 1.85¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.00¢
3 in. x 5-16 in. and ⅜ in.	2.25¢
1½ to 2½ in. x ⅜ in.	2.10¢
1½ to 2¾ in. x 5-16 in. and thicker	2.00¢
1 to 1¼ in. x 3-16 in.	2.10¢
1 to 1¼ x ⅛ in.	2.20¢
⅞ x ⅛ in.	2.30¢
¾ x ⅛ in.	2.40¢
⅝ x ⅛ in.	3.45¢
½ x 3-32 in.	4.35¢

Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.05¢
Beams	2.00¢
Channels, 3 in. and larger	2.00¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.80¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.55¢	2.80¢
Nos. 18 to 20	₩ lb 2.70¢	2.90¢
Nos. 22 and 24	₩ lb 2.75¢	3.00¢
No. 26	₩ lb 2.80¢	3.10¢
No. 28	₩ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ lb 2.95¢
Nos. 22 to 24	₩ lb 3.30¢
No. 26	₩ lb 3.50¢
No. 28	₩ lb 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 6.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.80
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.60
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 1, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ lb

Brass Wire—

List August 1, 1908. 14½¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 13½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished

METALS—

Tin—

Straits Pig ₩ lb @26¢

Copper—

Lake Ingot	₩ lb 16¾@15
Electrolytic	₩ lb 16@15¾
Casting	₩ lb 14¾@14½

Spelter—

Western ₩ lb 7@6¾

Zinc.

No 9. base, casks ₩ lb 6 ¢ | Open ₩ lb

Lead.

American Pig	₩ lb 5 @4¾
Bar	₩ lb 6@5¾

Solder.

½ & ½, guaranteed	₩ lb 23 @22
No. 1	₩ lb 24 @23
Refined	₩ lb 24 @23

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb @8¾
Hallette	@8¼
Other Brands	@7

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting	Base Price
Rods & Wire	Base Price
Sheets	Base Price

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 16.75@16.50
Copper, Heavy and Wire	₩ lb 16.50@16.25
Copper, Light and Bottoms	₩ lb 15.50@15.25
Brass, Heavy	₩ lb 7.00@6.75
Brass, Light	₩ lb 5.50@5.25
Heavy Machine Composition	₩ lb 9.25@9.00
Clean Brass Turnings	₩ lb 7.00@6.75
Composition Turnings	₩ lb 8.25@8.00
Lead, Heavy	₩ lb @4.25
Lead, Tea	₩ lb @3.75
Zinc Scrap	₩ lb @4.00

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Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

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